

REPORT AND PROCEEDINGS

Policy Roundtable Achieving the NUSP Vision: the Importance of Decentralized Options

Organised by: Bill and Melinda Gates Foundation & Centre for Policy Research
Supported by the Ministry of Urban Development, Government of India
22nd March, 2014



Contents

- 1. Roundtable Talks, Presentations and Discussions Report**
 - A. Inaugural Session**
 - B. Roundtable Discussions:**
 - C. Presentations**
 - D. Invited Responses**
 - E. Open Discussions**
- 2. Annexure 1: Pictures of the Roundtable meeting**
- 3. Annexure 2: Concept Note and Agenda for the Policy Roundtable**
- 4. Annexure 3: Some presentations made at the Roundtable**
- 5. Annexure 4: List of Participants**

1. Roundtable Talks, Presentations and interventions Proceedings Report

A. Inaugural Session

Welcome and Introduction to the Roundtable: Mr Shubhagato Dasgupta, Senior Fellow, Centre for Policy Research

Mr Dasgupta began his presentation by describing India's urban sanitation situation as a massive crisis. He highlighted how India contributes close to 48% of the estimated global urban open defecation and with an expected increase in India's urban population in the coming decades; the crisis is set to worsen if steps are not taken to address the same. Mr Dasgupta pointed out that there is an increasing understanding and acknowledgement of the costs of inadequate sanitation in urban India. He then presented from the Census 2011 data on how open defecation varies across states and city sizes in India and an estimated wastewater flow diagram for urban India. Mr Dasgupta then traced the different central government programmes in India that were initiated to address sanitation or have contributed towards addressing sanitation. He then went on to explain how the evolution of the objectives of these domestic programmes is broadly consistent with and have followed the international efforts in raising attention and calling for action on addressing the challenges in access to safe water and sanitation.

Mr Dasgupta argued that in the modern era, leaps in improving access to water and sanitation was achieved through periods of sustained focus and the factors which contributed to the improvements during each of these periods may be grouped into the four following categories i) technological innovation, ii) introduction of rules and regulation iii) changes in institutional arrangements and iv) institutions and individuals who championed the change. He concluded by presenting the agenda for the round table discussion.

Address : Ms Nandita Mishra, Director (PHE), Ministry of Urban Development

Ms Mishra began her address by welcoming all the participants on behalf of the Ministry of Urban Development to the roundtable. After highlighting the status of urban sanitation infrastructure and services in India, she briefly spoke about the National Urban Sanitation Policy (NUSP) and the initiatives like the preparation of CSPs & SSSs and Service Level Benchmarking, coordinated by the Ministry of Urban Development to improve levels of urban sanitation. Ms Mishra then went on to speak about the fund requirements for scaling up basic urban infrastructure as estimated by various committees.

Ms Mishra then acknowledged that India has to look beyond centralized sewerage systems to address its urban sanitation situation. She then went onto point out that apart from being capital intensive; the low and intermittent availability of water supply often cause choking and gasification of sewer lines. She brought to attention that the revised and updated manual

on 'Sewerage and Sewage Treatment' of the CPHEEO defines decentralized wastewater systems and provides guidelines for their design and implementation. Ms Mishra pointed out that every 'micro zone' should begin to own up its responsibility of excreta and sullage management and not expect another area to receive it, causing potential conflicts. She concluded her address by listing out the aspects the Ministry of Urban Development would focus on and promote to improve urban sanitation during the 12th Five Year Plan Period.

Special Address : Mr Injeti Srinivas, Additional Chief Secretary, Government of Odisha

Mr Srinivas began his presentation by giving figures of how India contributes to over 50% of the global open defecation and inadequate sanitation costs India 6.4% of its GDP (as estimated by WSP for 2006). He mentioned that it is important to repeatedly cite these figures to adequately convey the scale of the challenge. Mr Srinivas commented that the government response to this challenge so far is inadequate and improving urban sanitation in India requires a more comprehensive approach. He pointed out that wastewater treatment or faecal sludge management continues to be low on the priority of both private and public investment in India. Mr Srinivas then argued that smaller cities and towns in India need 'efficient, effective and low maintenance' systems of wastewater management, as it may not be possible to build conventional sewerage systems using public funds in these cities and towns.

Mr Srinivas then gave a brief profile of the initiatives taken up in Odisha state to improve urban sanitation, which involved ongoing sewerage schemes, installation of toilets and preparation of city sanitation plans and state sanitation strategies. He estimated that additional Rs 7000 crore would be required to extend sewerage systems to all urban local bodies in the state. Mr Srinivas then went on to speak about choosing the appropriate technology for scaling up sanitation services across India. He presented the example of how India had to develop a modified switching system before it could extend telephone coverage to all villages. Mr Srinivas concluded his presentation by presenting a policy and planning approach that may be adopted in a mission mode to scale up urban sanitation in India. He pointed out that India in her history has overcome several challenges and with focused effort India can achieve desired levels of urban sanitation.

Inaugural Address : Ms Anita Agnihotri, Secretary, Ministry of Housing and Urban Alleviation

Ms Agnihotri began her address by thanking the organizers for inviting her to deliver the inaugural address. She pointed out how Indian cities are often sites of stark contrasts, where slums and poor urban services co exist with imposing cityscapes. Ms Agnihotri remarked that she has begun to wonder whether India has started to accept the death and morbidity of its children that it is not on a mission mode to improve urban sanitation and that it sufficient resources can be mobilized if the country as the will. Ms Agnihotri pointed out that in cities along with the management of faecal waste, adequate access to toilets still remains a challenge for people living in slums, people who travel into the city for work etc.

Ms Agnihotri remarked that there is a need to orient the urban sanitation situation as a public health challenge rather than an infrastructural one. She pointed out that to achieve the vision of cities with adequate levels of sanitation, synergies should be explored with other urban programmes and policies. As an example she noted that the National Urban Livelihoods Mission could provide an opportunity and resources for imparting skill training to potential operators of decentralized wastewater systems. Ms Agnihotri concluded her address by saying that there should be continued effort to prioritize urban sanitation and that the NUSP vision can be achieved.

B. Roundtable Discussions:

Co-Chair : Dr K VijayRaghavan, Secretary, Department of Biotechnology

Dr VijayRaghavan in his opening remarks as the co chair to the roundtable, expressed that the scale and complexity of the urban sanitation challenge may indeed be large but it may be overcome if the country focuses its effort on it. He pointed out that history bears several examples of science and technology's remarkable potential to make transformative societal changes. Dr VijayRaghavan pointed out that a Mission mode approach could be suited to address the challenge of urban sanitation and scientists and engineers should be part of the mission to develop appropriate technologies to support it. He also mentioned that there is need for inter-ministerial action to take this agenda forward.

Co-Chair : Mr Brian Arbogast, Director WASH, BMGF

Mr Arbogast in his opening remarks as co-chair of the round table expressed that the way access to sanitation is measured around the World is inadequate. He stressed that the policy discussions on access to safe water and sanitation needs to urgently include the levels of

excreta safely treated and not just access to toilets. To elaborate this point Mr Arbogast presented details from a case study of Dhaka city (in Bangladesh) where it was found that although the open defecation rate has been brought down to 2-3% close to 98% of the faecal matter enters the environment without adequate treatment. Mr Arbogast, stressed the importance of safely treating all the faecal waste before disposing it to the environment if the society has to benefit from the positive outcomes of safe sanitation. He pointed out that tracking and targeting are important policy tools and therefore the availability of infrastructure and services to safely collect, treat and dispose faecal sludge should also be tracked.

He then briefly spoke about the Bill and Melinda Gates Foundation's investments in improving sanitation through their grants to the research and development of 'transformative technologies' (which would help in safe collection and treatment of faecal sludge from dry and wet pit latrines, septic tanks etc.) and to 'reinvent the toilet' by inventing toilets which would not only collect the waste but also treat it to the desired level with very small energy input and thereby collapsing the sanitation service chain.

C. Presentations

Presentation 1: Urban Sanitation Planning through alternative approaches : Initiatives in Tripura - Dr Dr. K. Rajeshwara Rao, Principal Secretary to the Government of Tripura

Dr. K. Rajeshwara Rao, Principal Secretary to the Government of Tripura presented on a septage management scheme in Bishalgarh Municipality in Tripura. The scheme is an end-to-end solution for collection, transport, treatment and reuse of fecal sludge from the septic tanks along with effective treatment and disposal of liquid effluent from septic tanks. Most of the septic tanks in Bishalgarh that are connected to a sock-pit are located in low-land area and high water table, resulting in contamination in the area surrounding the septic tank. These septic tanks are proposed to be connected to the decentralized treatment systems having horizontal planted gravel filter technology. He also emphasized on the need of effective consultations with key stakeholders during the process of implementing such projects.

Presentation 2: Lessons from the implementation of decentralized sanitation in Senegal - Dr Doulaye Kone, Senior Program Officer, Bill and Melinda Gates Foundation

Dr Kone's presentation focused on discussing successful models and practices of non sewerage sanitation management from around the World. The presentation was largely based on a landscape study of faecal sludge management practices in 30 cities in Asia and Africa conducted by the Bill and Melinda Gates Foundation. All the practices included in the study involved mechanical emptying of pits or septic tanks and transporting them in trucks before disposing them in a safe manner.

Dr Kone presented the different regulatory environments and institutional mechanisms under which these services were functioning. He pointed out that in several cities the private sector is actively involved in providing the pit emptying and transport service. He concluded his presentation by noting that there is an opportunity to shape affordable service provision business models that promote non-sewered sanitation in India and the keys to it include a) choosing the right technology and service that meets user preferences and are suited to the region and b) a supportive policy and regulatory environment which ensures appropriate market structure, availability of machinery and inclusion of the poor households.

Presentation 3: Government Policy as Key enabling factor: Decentralised systems in Indonesia - Ms Almut Weitz, Principal Regional Team Leader, Water and Sanitation Program

Ms. Almut Weitz, presented on the Indonesia case where the country has looked beyond the conventional sewerage systems and have institutionalized implementation of sanitation service chain. She highlighted that Indonesia is a densely populated country and facing similar problems as India in terms of high growth of urbanization levels and their need for better water and sanitation services. The Indonesian government through its policies and programmes have focused on decentralized solutions and improving existing on-site systems with better fecal sludge management. The community DEWATS systems are running well in most of the areas where they were installed.

D. Invited Responses

Mr Phaninder Reddy, Secretary, Government of Tamil Nadu

Mr Reddy spoke about how in Tamil Nadu 43 cities or towns have underground sewerage networks and they are being planned for 23 other cities and towns. He pointed out that in Tamil Nadu one of the major problem is mixing of wastewater with the storm water in the drains. This has resulted in the need to treat stormwater before discharged into water bodies. Mr Reddy also pointed out how in cities where new sewerage systems are being installed they are planning to collect different charges from people who connect directly to the system and people who connect their septic tanks, to encourage every household to connect. Mr Reddy requested the central government to allocate support to state universities to do more research on wastewater management.

Mr Bariwal, Director, LSG, Government of Rajasthan

Mr Bariwal gave a brief profile of urban sanitation management in Rajasthan. He pointed out how they have partnered with industry to provide sewerage services in the city of Udaipur. He pointed out that a water deficient state like Rajasthan is keen to learn about less water intensive wastewater management systems.

Mr Rajeev Jalota, Additional Commissioner, Municipal Corporation of Greater Mumbai

Mr Jalota pointed out that in a large city like Mumbai there are multiple challenges to achieving adequate levels of sanitation. A large number of residents continue to defecate in the open, as toilet coverage is deficient in slums and in some cases severely deficient. He pointed out that it is important to continue to work on improving the design, built and management of community toilets as in cities like Mumbai, large number of people are likely to continue depending on these in the near to medium future. Mr Jalota also pointed out that innovation is required in the machinery used and practices followed in cleaning sewer lines as the current practice is not environmentally safe and pose health hazards to the workers involved.

Mr Jalota mentioned that in Mumbai several slums are not connected to the sewerage network. In such slums community toilets when connected to the septic tanks often face the problem of not functioning to the required standards and therefore the toilet becoming non usable. He also pointed out that in slums when community toilets are connected to septic tanks it is also difficult and costly to relocate the community toilet. Mr Jalota pointed out that the way forward in improving urban sanitation involves everyone to

Mr Ramyakumar Bhatt, Assistant Commissioner, Ahmedabad Municipal Corporation

Mr Bhatt remarked that in the city of Ahmedabad open defecation is being practised, especially by children in slum areas. He pointed out that communication and behaviour change campaigns should be taken up to supplement infrastructure creation efforts. He pointed out that laying sewerage pipes in old city areas is a difficult exercise. Therefore alternative systems are needed to supplement the grid based systems even in large cities. He extended an offer of support on behalf of Ahmedabad Municipal Corporation to any organization which wants to pilot an alternative system of wastewater treatment.

E. Open Discussions

Dr Renu Khosla, Director, Centre for Urban and Regional Excellence, New Delhi

Dr Khosla introduced her organisation and said that they have been implementing a variety of sanitation programs and have also been involved in drawing up the City Sanitation Plan for Agra. She emphasised that especially in slum situations the need for decentralised solutions is very strong. She also mentioned that a significant amount of capacity building for local bodies and awareness generation in communities is required. Dr Khosla pointed out that the Ministry of Urban Development should assess the different technology options and include them in the manual, so that proposals based on alternative, decentralised wastewater management systems could be considered for receiving support from centrally funded

programmes. She went on to say that women also should be made central to deciding about sanitation solutions as they more than men see it as a higher priority.

Mr Krishna Gopal, NUSP Support Cell, Ministry of Urban Development

Mr Gopal clarified the point raised by Dr Khosla and said that the revised and updated Manual on Sewerage and Sewage Management in India discusses different options for decentralized wastewater treatment and is supportive of decentralized systems.

Prof. Dinesh Mehta, Professor Emeritus, CEPT University

In continuation with the discussion started by Dr Khosla and continued by Mr Gopal, Prof. Mehta said that in his experience the PWD Schedule of Rates, a document which provides guidance on the current cost of undertaking various public works within the state, currently does not include the costs of constructing decentralized wastewater treatment options. This leaves the state level agency in charge of appraising proposals for building such systems using public funds with little guidance on appraising the proposal and results in the sidelining of such proposals.

Ms Regina Dube, Senior Adviser, GIZ India

from the GIZ, the German government development agency, in her comments appraised the participants of the detailed work on City Sanitation Plans and State Sanitation Strategies. She mentioned that there was a strong case based on their experience for an inter-ministerial group at the national level, which can both look to adopt new solutions, but can also help encourage cities and state governments to give higher priority to sanitation esp. urban sanitation.

Prof. Srinivas Chary, Dean, Administrative Staff College of India, Hyderabad,

requested that the organisers of this event should try and draft a declaration/resolution, based on the discussions held at the Roundtable. He elaborated on how in 2004, exactly 10 years earlier, a similar event was organised by ASCI-YASHADA-SPARC in Pune along with the city government which had Shri Ratnakar Gaikward as its Commissioner, which led to the 'Pune Declaration', which then led to a formation of a Task Force that ultimately led to the institution of the National Urban Sanitation Policy in 2008. He mentioned that this then led to the development of many new instruments including the City Sanitation Plans, the State Strategies and to the award scheme under the NUSP and gave a big fillip to the urban sanitation sector.

Annexure 1: Pictures of the Roundtable meeting



Annexure 2: Concept Note and Agenda for the Policy Roundtable

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POLICY ROUNDTABLE

Achieving the NUSP Vision; the Importance of Decentralized Options

Background

The latest census conducted by the Government of India (2011), counted close to six million urban residents who defecate in the open. India continues to perform poorer than other developing regions of the world like East Asia and Latin America when it comes to improving access to toilets in urban areas (chart 1 below). As established by the National Family Health Surveys, the access to toilets has been the weakest in the lower wealth quintiles of the population even in urban areas (chart 2 below). For Indian cities open defecation is only part of the challenge that waits to be addressed. They have a long way to go before all the waste generated is safely collected, conveyed, treated and disposed (chart 3 below). The conditions in slums are worse than urban areas as a whole, with 19% defecating in the open, 10 % using unimproved toilets, 15.1% using community/public toilets and only 24.5% reporting sewerage connections and another 31% reporting toilets with septic tanks (chart 4).

As per the Census 2011 only 32.7 % of the urban population is connected to underground sewerage and the Central Pollution Control Board (CPCB 2010) has estimated that there is installed treatment capacity for only 31% of the sewage generated in the Class I and II cities in India. Consequently weak sanitation has significant health costs and untreated sewage from cities is the single biggest source of water resource pollution in India. A World Bank (WSP 2011) study estimated the economic impact of inadequate sanitation at 6.4% of India's GDP in 2006. The intensity of these losses is higher in urban areas. These studies indicate

both the scale of the challenge ahead of the Indian cities and the huge costs incurred from not addressing them.

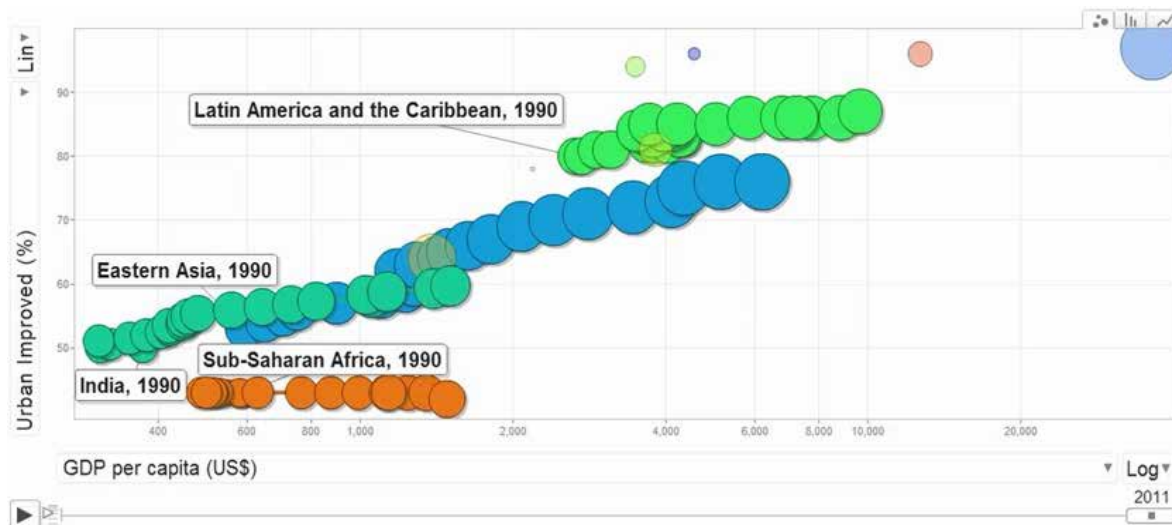


Chart 1: The chart illustrates how India compares with Latin America, East Asia and Sub Saharan Africa when the % of urban population with access to improved sanitation is plotted against per capita GDP between 1990 -2011.

Poorest have least access to toilets

Wealth-based Differential in Distribution of Population with Toilets in Urban Areas

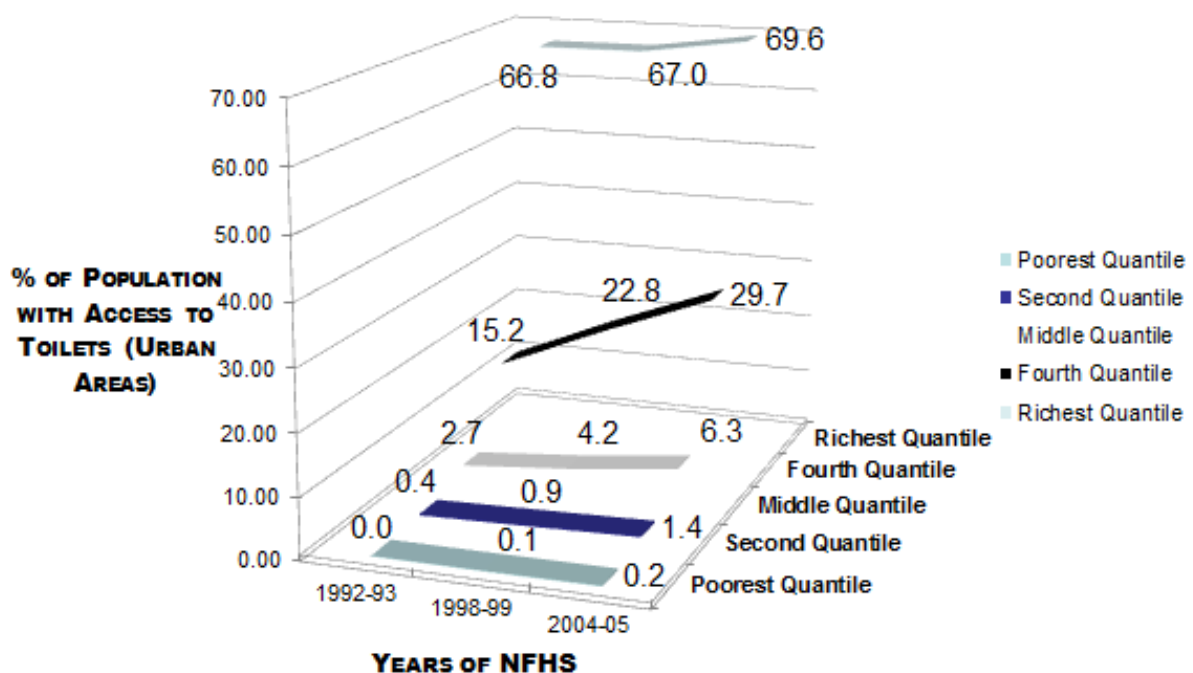


Chart 2: Access to toilets in urban areas in five wealth based quintiles of the population, *Source: NFHS, 1992-93; 1998-99 and 2004-05. CPR Analysis.*

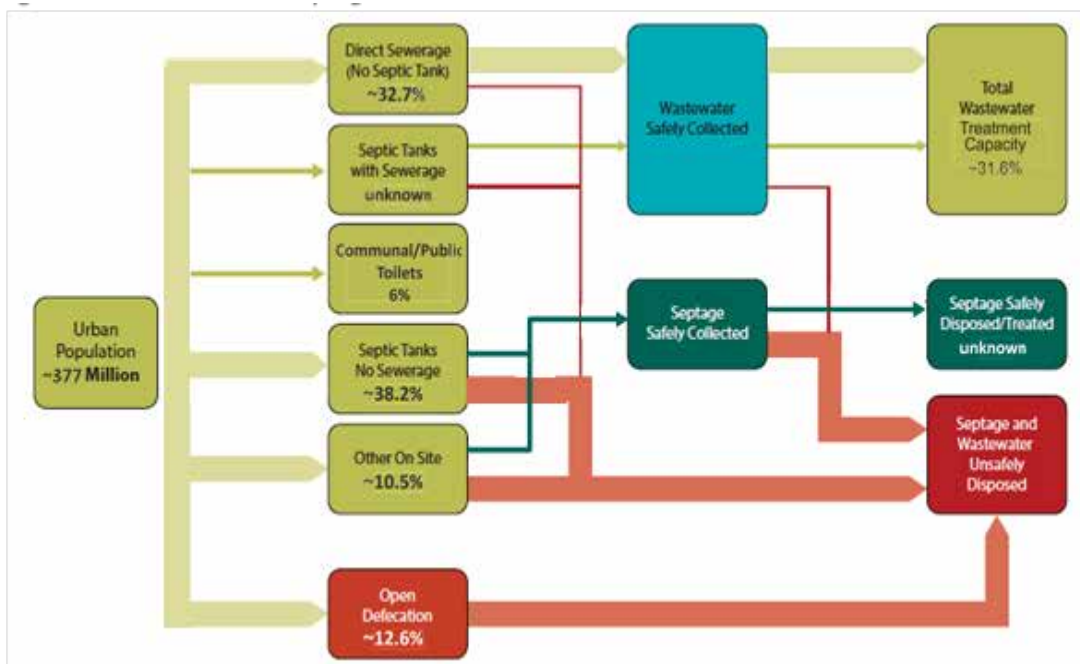


Chart 3: Wastewater and Septage Flow in Urban India. *Source: Census 2011, CPCB (2010), CPR Analysis*

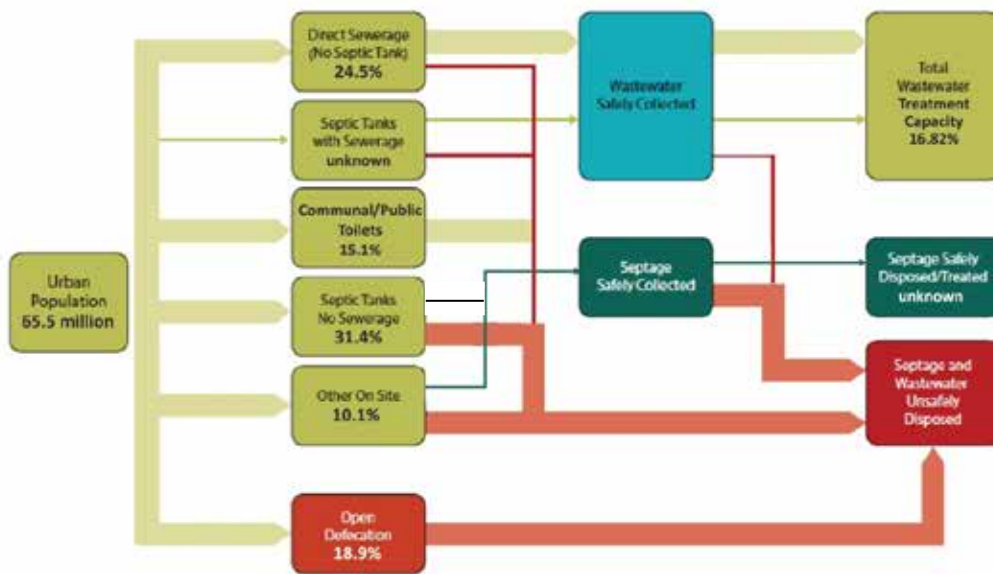


Chart 4: Wastewater and Septage Flow in Urban India – Slums. Source: Census 2011, CPCB (2010), CPR Analysis

Urban sanitation has started to receive serious policy attention only relatively lately. The National Urban Sanitation Policy (NUSP) launched by the Government of India in 2008 has since played an important role in bringing much needed attention to urban sanitation in India. The NUSP has been successful in initiating many processes like integrated city sanitation planning and service level benchmarking in different cities across India. Although the goal of achieving the desired levels of sanitation in urban India may seem large and daunting, it is important to note that the policy environment and resources being made available to the sector is steadily and surely increasing.

The JNNURM launched in 2005, has funded several sewerage and waste water treatment projects and has played a part in improving treatment capacity and network coverage across India as in Box 1. But, interestingly the JNNURM figures also indicate that all the projects focused on building or augmenting conventional sewerage systems. Do all cities need or can all Indian cities afford to focus on and commit their resources to achieving the desired levels of sanitation through centralized sewerage systems? Today there seems to be an increasing recognition including at the highest levels of policy making (*see Box 2 below*) that the answer to the above question is no. This ‘one size fits all’ approach has also not recognised that the sanitation chain would need investments for eliminating the high level of open defecation especially among the poor and in slums as well as develop solutions for managing and treating the discharge from onsite systems. This brings forth an important policy question. What reasons contribute to the observed inertia in Indian cities towards adopting decentralized systems and what steps may be taken to address them?

JNNURM – Sanitation Highlights

- § 200 projects
- § In 134 cities
- § ~ Rs 17,000 crores (Total Project Cost)
- § All Projects are Sewage Treatment Plants or Underground Sewerage Networks

Box 1: Provides facts on sewerage funding in JNNURM between 2005 and June, 2013

" ...if we plan to address the urban sanitation challenge by waiting for all cities and towns to build sewerage systems we would be setting back our goal of achieving the NUSP vision and in turn incur huge costs; both directly and indirectly..."

Box 2: Dr Sudhir Krishna IAS, Secretary, MoUD (2013)

The Policy Roundtable

The policy roundtable is being organized by the Bill and Melinda Gates Foundation (BMGF), jointly with the Centre for Policy Research (CPR), New Delhi. The roundtable is being held

alongside the second Re-invent the Toilet Fair, being organised by the BMGF from the 20-22nd March 2014, at the Taj Palace Hotel, New Delhi, India, which demonstrates a number of new technologies across the sanitation value chain. The timing of this Roundtable is also opportune for a number of reasons, which are:

- (a) It is now 10 years since a National Workshop held in Pune under the aegis of the then Ministry of Urban Development and Poverty Alleviation, Government of India and which led to the Pune Declaration on Urban Sanitation in 2004. Following this, the Government of India had instated a Task Force to study and make recommendations for policy action in the urban sanitation sector. The work of this Task Force led to the formulation of the National Urban Sanitation Policy, in 2008.
- (b) The NUSP set out a vision that “All Indian cities and towns become totally sanitized, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women”. The NUSP has now seen more than 5 years of implementation, and a relook and learning of lessons from its implementation is due,
- (c) The next phase of the Jawaharlal Nehru National Urban Renewal Mission is on the anvil and is likely to incorporate the Total Urban Sanitation Programme to scale up investment in urban sanitation sector.

The roundtable aims to bring together senior policy makers, city and state level implementers, technocrats and sector experts to brainstorm around the need to have alternative institutional, technological and governance models for transforming the urban sanitation sector in all aspects of the value chain, if the NUSP vision is to be achieved. An important group of participants would be senior officials from state governments that are actively involved (with the city governments) in planning initiatives and implementing projects to improve the urban sanitation situation in their respective states. Other participants at the roundtable would include representatives from a few city governments. The third group of participants would include representatives from different organizations including donor agencies who have closely worked with state and city governments across India on initiatives in urban sanitation and between them have considerable expertise in the sector.

After introductory presentations, the roundtable would have presentations from some state government officials on the role envisaged by them for alternative solutions across the sanitation value chain for improving urban sanitation outcomes. This would be followed by presentations which showcase successful initiatives of improving urban sanitation through decentralized¹ systems. The presentations would be followed by responses from the state and

¹ Decentralized systems here refers to both onsite and off site sanitation systems including, emerging breakthrough technologies displayed at RTTF, 2014; improved Pit designs and Septic Tanks; and off site sanitation systems including Septic Tank/common septic tank + Septage transport + Treatment + Reuse/disposal and waste water collection and transport + waste water treatment + reuse/discharge (3 mld or less).

city governments. These responses are expected to bring out important reasons why Indian cities do not have decentralized systems and evaluate the adaptability of the initiatives (presented during the roundtable) in their respective states and cities. The presentations and responses are expected to set the agenda for the open discussion, which would aim to arrive at steps that need to be taken by the different levels of government and other stakeholders to increase the adoption of new and improved technologies and decentralized systems for improving urban sanitation in India.

References

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Programme Schedule

Jehangir Hall, Taj Palace Hotel, Sardar Patel Marg, Diplomatic Enclave
New Delhi - 110 021

Time	Agenda	Dignitaries/Resource Persons
22nd March 2014		
09:30 – 10:15	Guided tour of the toilet fair: Departing from Roshanara Hall	
10:15 – 11:05	Inaugural Session	
	10:15 – 10:25	Welcome Remarks and Introduction to the Roundtable – Mr Shubhagato Dasgupta, Senior Fellow, Centre for Policy Research, New Delhi
	10:25 – 10:35	Address – Ms Nandita Mishra, Director (PHE), Ministry of Urban Development, Government of India
	10:35 - 10:50	Special Address: The Important Role of Decentralized Sanitation Systems in Smaller Cities – Mr Injeti Srinivas IAS, Additional Chief Secretary, Government of Odisha
	10:50 – 11:05	Inaugural Address: Critical need for Innovative Sanitation Solutions for Slums – Ms. Anita Agnihotri, Secretary, Ministry of Housing and Urban Poverty Alleviation, Government of India
11:05 – 13:00	Policy Roundtable: Achieving the NUSP Vision; The Need and Role of Decentralized Options	
	Chairs: Mr Brian Arbogast, Director, Water Sanitation and Hygiene Program, Bill and Melinda Gates Foundation and Mr K VijayRaghavan, Secretary, Department of Biotechnology, Ministry of Science and Technology, Government of India.	
	11.05 – 11.20	Introductory Remarks: Mr K VijayRaghavan Mr Brian Arbogast
	11.20 - 11.30	State Perspectives: Urban Sanitation Planning through Alternative Approaches; Initiatives in Tripura - Mr K Rajeshwar Rao IAS, Principal Secretary, Government of Tripura
	11.30 - 11.40	Lessons from the Implementation of Decentralized Sanitation in Senegal – Doulaye Kone, Senior Program Officer, Bill and Malinda Gates Foundation
	11.40 - 11.50	Government Policy as a Key Enabling Factor; Decentralized Systems helped Indonesia make rapid progress in Urban Sanitation – Almud Weitz. PTL, Water and Sanitation Program, the World Bank.
	11.50 – 12.25	Invited Responses (State/City Governments), Rajasthan, Tamil Nadu, Mumbai, Ahmedabad, other
	12:25 – 12:50	Open Discussion
	12.50 – 13.00	Concluding Remarks: Mr Jan Willem Rosenboom, Senior Program Officer, Bill and Melinda Gates Foundation
13:00	Lunch	

Annexure 3: Some presentations made at the Roundtable




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WELCOME

TO THE

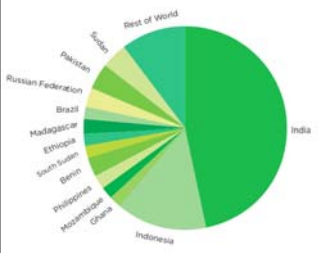
POLICY ROUNDTABLE

Achieving the NUSP Vision:
the Importance of Decentralized Options

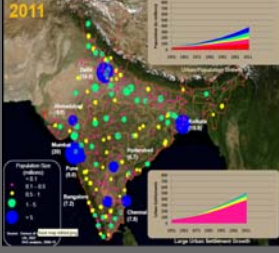
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New Delhi



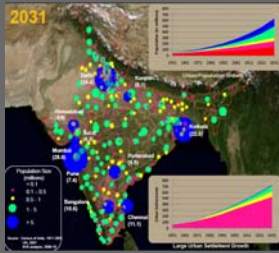
The Scale of India's Urban sanitation crisis is massive...



48% of global urban OD



11% of global urban popl



60% additional urban popl
(221 m) Indonesia/ Brazil

...there is an increased realization of the significance of this crisis :

Health Benefits; Miasma-water borne – sanitation related - stunting

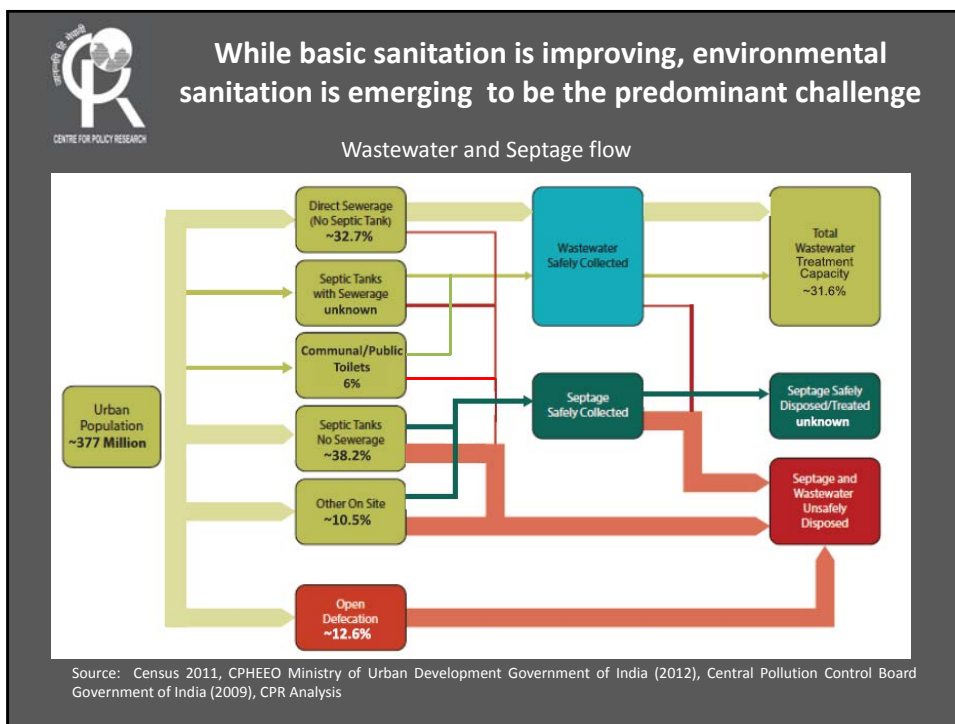
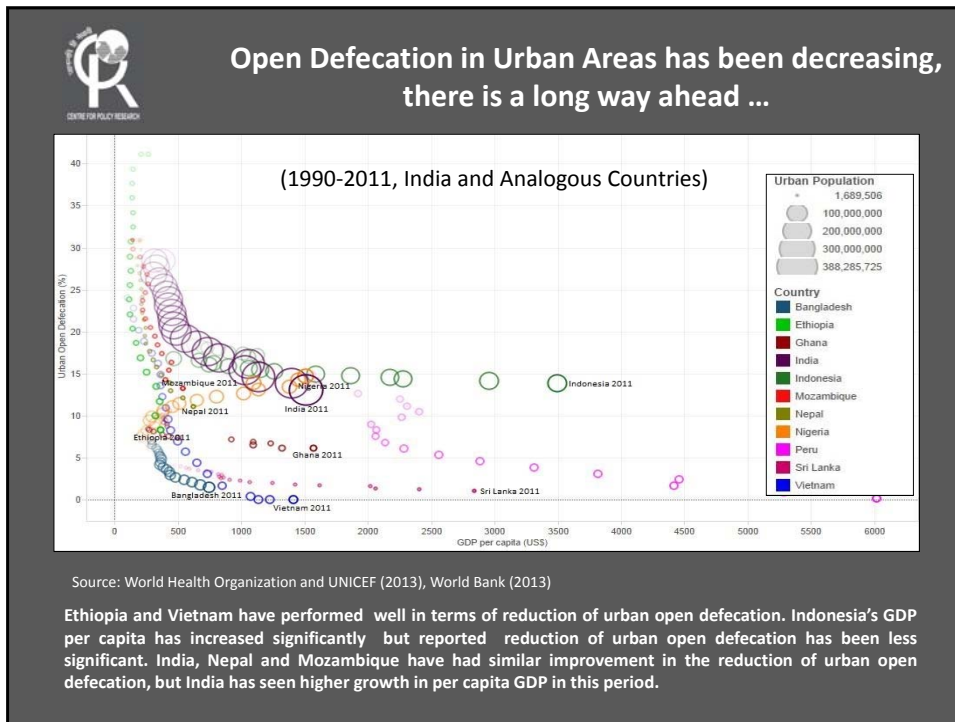
Resource efficiencies

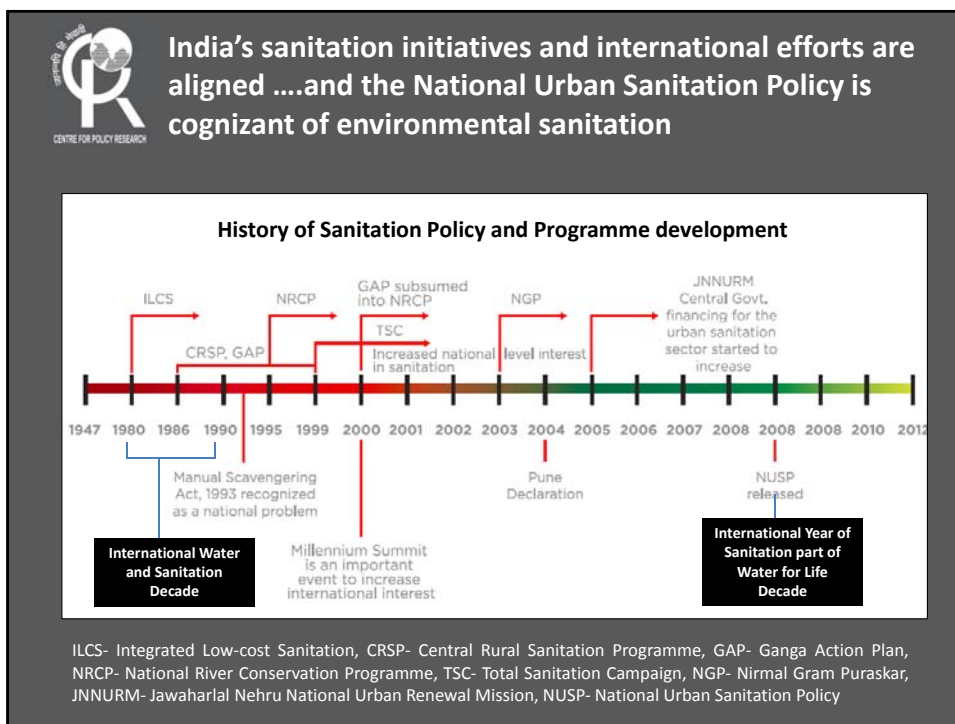
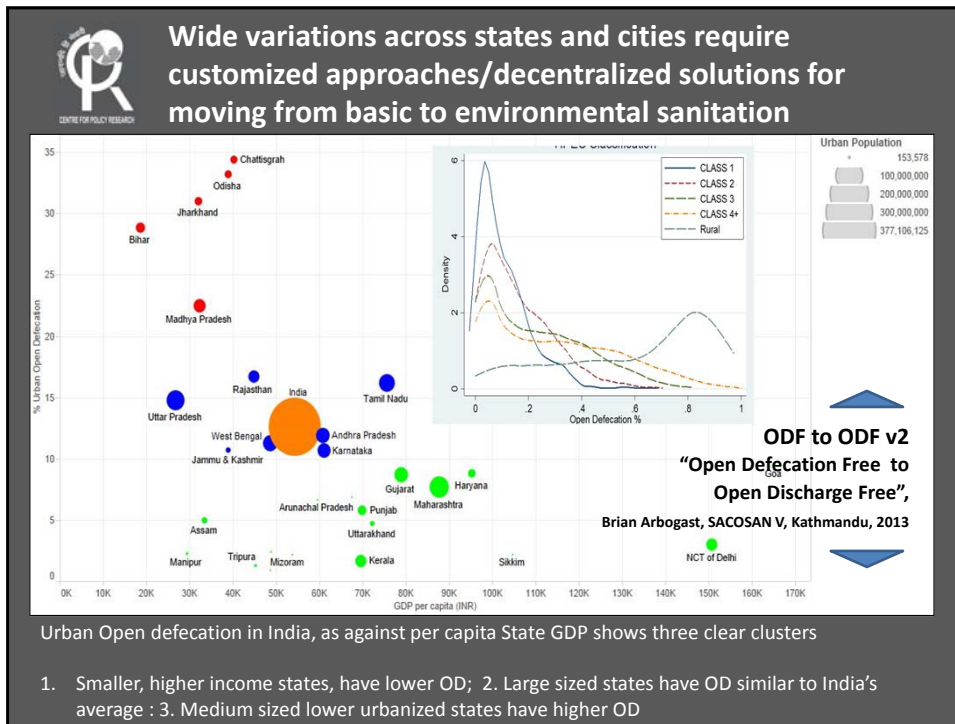
Climate Change resilience

Economic Benefits

Equity and dignity – Poor, women, children, work related

Sources: JMP 2013, IHS 2011





Scaling up customized approaches/ decentralized solutions will require suitable Technologies, Industry Structure, Institutions and Champions of Change

The 'Great Stink', 1858 onwards (1850-1920)

International Drinking Water Supply and Sanitation Decade – MDGs (1980-2015)

Post MDGs - SDGs

<ul style="list-style-type: none"> ▪ Technology: Combined underground sewers, connecting cesspools to sewers, initially disposal into the river without treatment ▪ Industry structure/ regulation: Public Health Act 1848, Metropolitan Commission of Sewers Act 1848, Local Government Act 1894 ▪ Institutions: Metropolitan Board of Works to London City Council (~1880s) ▪ Champions of Change Dr. John Snow, Sir Edwin Chadwick, Dr Thomas Southwood Smith, Robert Koch, Sir John Harington, Joseph Bazalgette, others... ▪ From Urban to Rural, Strong Public Action, 65-70 years 	<ul style="list-style-type: none"> ▪ Technology: Improved hand-pumps; VIPs, Twin Pits, others ▪ Focused Geographies ▪ Industry structure/ regulation: Environmental standards; Contracts, etc ▪ Institutions: From state depts to State WS&S Boards. Ramakrishna Mission, WB/UNDP Technical Advisory Group – Water and Sanitation Program; Wateraid ▪ Champions of Change Peter Morgan, <i>John Kalbermatten</i>, John Pickford, Sandy Carincross, Ishwarbhai Patel, Bindeshwar Pathak, others ▪ Focus mainly on drinking water, sanitation – more rural, In India, focus on urban sewerage post 2005 (JNNURM). 35 yrs 	<ul style="list-style-type: none"> ▪ Technology:: ODFv2; RTTF 2014, RITC, Local innovators, viable Decentralised systems ▪ Industry regulation: Spetage regulations ▪ Institutions: Decentralised authority and accountability + <i>“Winning the heart and minds of users”</i> ▪ Champions of Change <i>People and partnerships - In this room!!</i> <p style="color: red; font-weight: bold; text-align: center;">FOCUS ON SANITATION</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

“...a clean body cannot reside in an unclean city”

– Mahatma Gandhi

Thank You



SCALING CITY INSTITUTIONS FOR INDIA



CENTRE FOR POLICY RESEARCH

Supported by



Ministry of Urban Development
Government of India



NUSP
NATIONAL URBAN SANITATION POLICY
TOWARDS CITY WIDE SANITATION



BILL & MELINDA GATES foundation

Policy Roundtable on Urban Sanitation

New Delhi

22 March 2014

-Strategic Options-

Injeti Srinivas
Development Commissioner &
Additional Chief Secretary H&UD
Government of Odisha

The Challenge & Opportunity

At global level 2.5 billion population lacks access to improved sanitation and 1 billion practice open defecation (OD) causing 2.7 million deaths, including 0.8 million children dying of diarrheal disease (India alone accounts for 0.7 million); diarrhoea, stunting and lower school and work productivity

India alone accounts for 60% of global OD (600 million) and 48% in urban areas (51 million)

GDP loss to India on account of poor sanitation is 6.4% (US\$ 54 billion or Rs 3.24 lakh crore)

Globally improved sanitation has a RoR of more than 5X for every \$ invested; other benefits include more tourism, better safety & security, higher land value, better water quality and greater dignity

Government response has been too late and too little

Need a comprehensive Approach

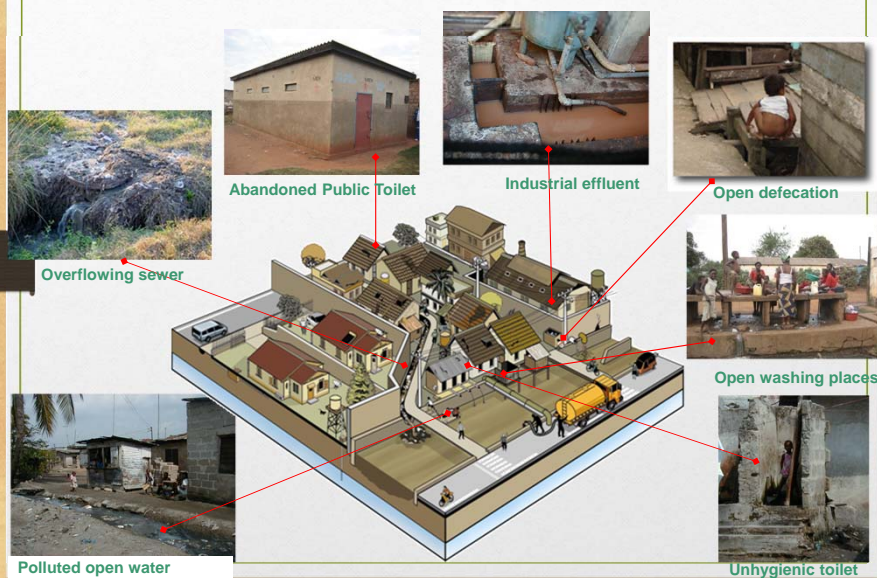
Nirmal Bharat Abhiyan for rural areas (over Rs 20,000 crore spent so far) **BUT** no comprehensive programme for urban areas although around Rs15,000 crore worth Sewerage projects have been supported under JnNURM and another Rs 2,800 crore under UIDSSMT

Actual requirement of funds is far more; for example Odisha alone requires an investment of over Rs 17,000 crore, including ongoing projects, for providing universal access to improved urban sanitation to 7 million (collection, storage, conveyance, treatment and disposal/ reuse)

The Integrated Low cost Sanitation Scheme of GoI never really took off and has got derailed. Given the high OD in Odisha, access to toilets is critical; demand exists for reasons of safety, convenience and privacy but affordability is a big problem; concessional finance and subsidy required to make it affordable.

Just toilets are not enough, treatment of waste water is equally important (eg. Bangladesh)

Typical Sanitation Profile in Urban India

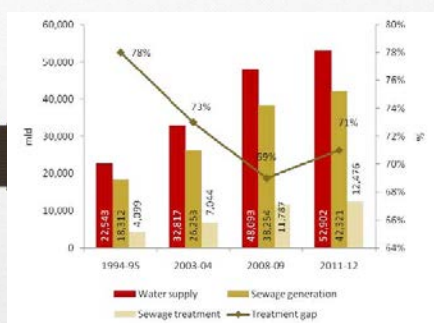


Experience So Far – Status of Sewerage Services in India

- **Inadequate Coverage of Sewerage Network** – Only 498 Urban Areas out of 7935 covered
- **Lack of Sewage Treatment Capacity** – Only 30% of the collected sewage Treated Before Disposal (12476 MLD is treated out of 42321 MLD sewage generation)
- **Poor Performance of Existing Systems:** Low Collection efficiency of Sewerage Networks and Poor Performance of STPs
- **Technical, Managerial & Financial Constraints of municipal bodies/ Implementing Agencies**

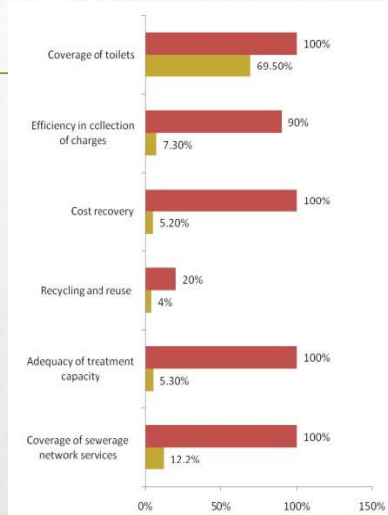
Source: Census 2011, Central Pollution Control Board(CPCB)

Status of Sewerage Services in India



Trends in Sewage Generation and Treatment

Source: Central Pollution Control Board 2013



Source: SLB Benchmark, MoUD

Urban Sanitation Scenario

S l.	Indicator	National (%)	Odisha (%)	Type of Access	Urban	
					World	India
1	Piped Sewer System	32.7	11.5			
2	Sewage Treatment	30	8	Open defecation	3.0%	13.1%
3	Households Having Latrine Facility Within Premises	81.40	64.8	Shared	13.0%	19.7%
4	Community Toilets	6	2	Other Unimproved	4.9%	7.5%
5	Open Defecation	12.6	33.2	Improved	79.9%	59.7%

Source: Census of India 2011

Source: WHO & UNICEF JMP 2013

Learning from experiences ...

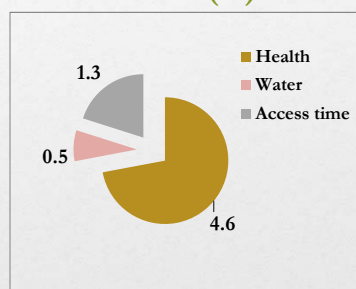
- ... wastewater treatment is one of the last priorities of public and private investment
 - > nobody is interested,
"arrangements" are easier

- ... conventional Collection & treatment systems are too expensive
 - > difficult to demand
their installation

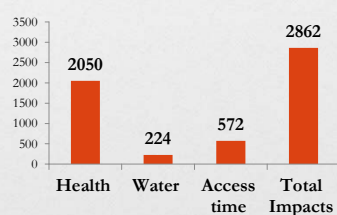
Impact of Poor Sanitation on Indian economy

Economic losses due to Poor Sanitation

Loss of GDP (%)

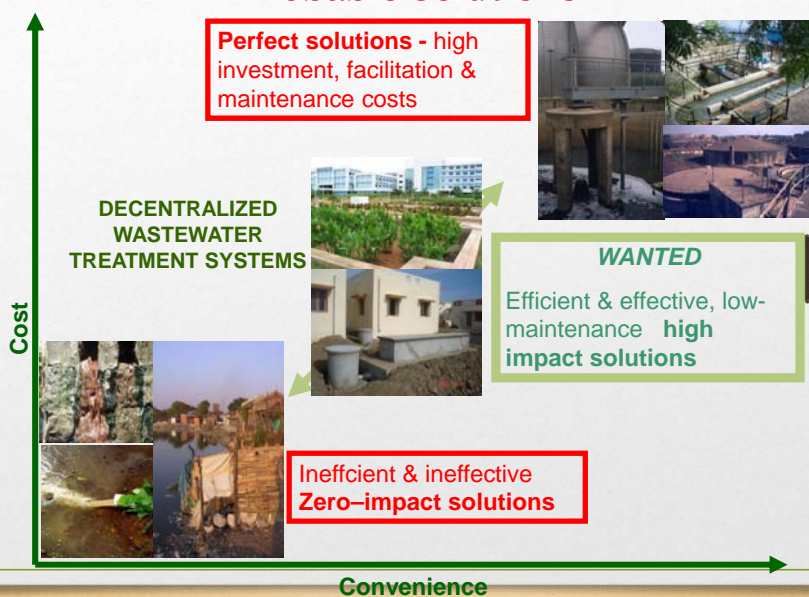


Loss of PCI (Rs/ 2012-13)

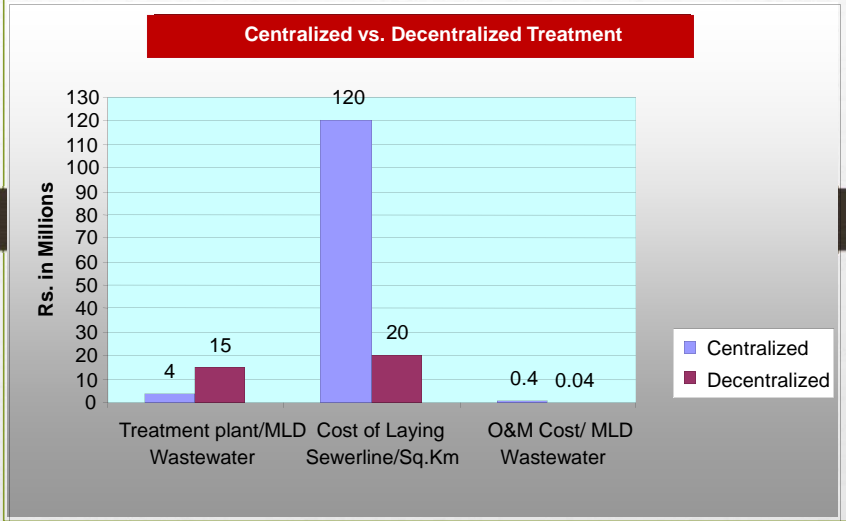


Economic Impacts of Sanitation in India, WSP Report, 2011

Probable Solutions



Comparison – Capital and O&M Cost



Urban Wastewater Management Scenario in Odisha

Sl.	Services (Urban)	Odisha
2	Sewerage Generation	635 MLD
3	Sewerage Generation in (Bhubaneswar, Cuttack and Puri)	297 MLD

46 %

Initiatives *(Projects under Execution)*

- **JnNURM, 12th FCA, JICA & SP** – Integrated Sewerage System in Bhubaneswar City – Rs754 Crs
- **NRCD & SP** –Sewerage Collection & Treatment System in Puri Town – Rs81 Crs
- **JICA & SP** – Orissa Integrated Sanitation Improvement Project in Cuttack City – Rs2100 Crs

46 % of the total Wastewater generated in Urban Odisha will be treated for safe disposal with completion of the above projects by 2017.

SP: State Plan

Initiatives...

- Sewerage System in Sambalpur & Rourkela (Included in JICA's rolling plan; HUDCO loan sanctioned)
- DPR for Sewerage System under Preparation for 15 Cities
- Project SAMMAN (Bhubaneswar & Cuttack; 27 public & 82 community toilets catering to 60,000; project cost of Rs 24.42 crore – Rs 6.99 crore from BMGF including PMU and balance from other sources)
- Odisha Urban Sanitation Strategy Framed (2011)
- City Sanitation Plan Prepared for 8 Cities

Wastewater Management in Odisha will increase to 63% with implementation of 104 MLD additional treatment capacity in Rourkela and Sambalpur Sewerage Schemes by 2018

Rs. 7,344 Crs required for covering balance ULBs of Odisha with Sewerage system

The Menace- Open Defecation

→ 53% Indian households defecate in open (67% in rural areas and 13% in urban)

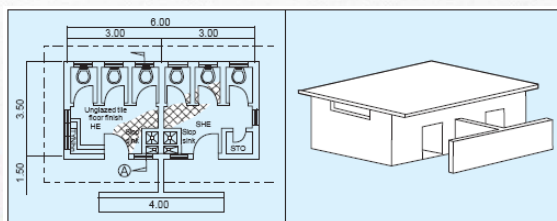
→ Open Defecation is a traditional behavior in rural India

Strategies

- Focus on disadvantages of open defecation to community – health, cultural and social problem
- Comprehensive scheme
- Construction is easy part, usage & maintenance is the key
- Demand driven instead of top down supply driven approach
- Do-it-yourself & Turnkey Service Provider approaches



On site Sanitation



Source: Philippines Sanitation Sourcebook and Decision Aid, WSP-EAP.

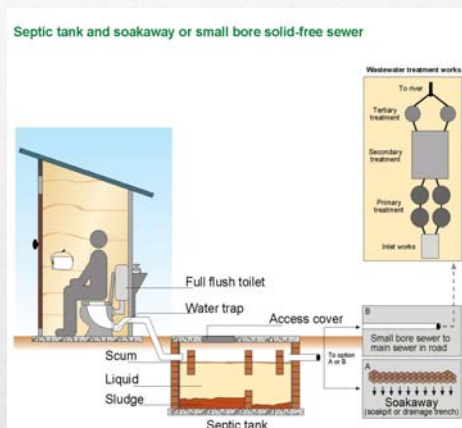
1. Community Toilets

2. Packaged Treatment Plants

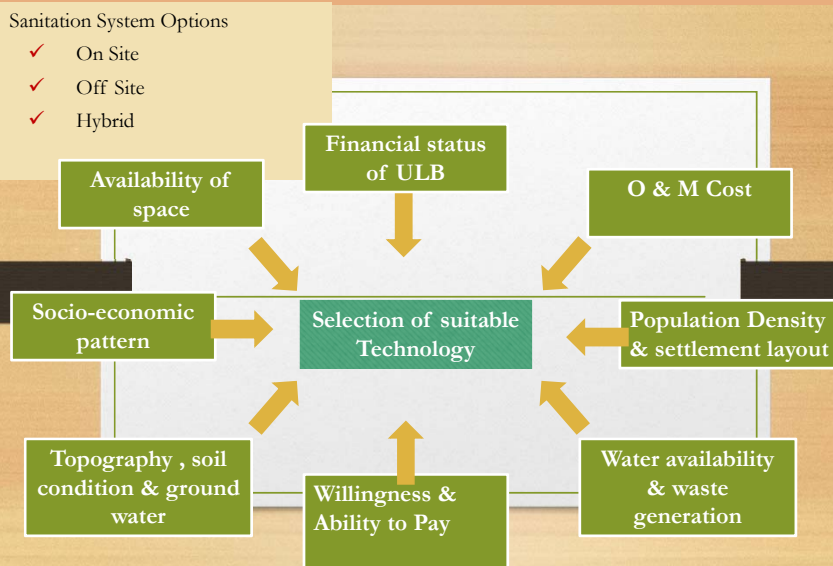


On site Sanitation

- 3. Decentralized Wastewater Treatment Systems (DEWATS)
- 4. Septic Tanks/ Small Bore



System Selection Criteria



City Sanitation Plan – Overview

Salient Features

- ✓ Pilot for 8 cities
- ✓ Integrated Approach (access to toilet, liquid & solid waste management and drainage)
- ✓ Data validation through sample survey
- ✓ Planning through consultative process
- ✓ IEC as a integral part of planning to achieve ODF status
- ✓ Developed on SLB framework

Description	Bhubaneswar	Cuttack	Berhampur	Puri	Rourkela	Sambalpur	Balasore	Baripada
Population (2011)	840834	610189	356598	200564	272721	184000	118160	109743
Households	196496	123034	74720	41140	61717	41553	25713	24718
Slum %	47%	42%	39%	46%	42.8%	37.9%	65%	25%
OD %	28%	14.6%	38%	33%	8%	35.8%	45%	21.5%
Investment Plan (Mn. Rs.)	1548.86	438.72	2709.10	677.48	3777.00	2865.00	1163.18	799.06

Note : The above investment plan does not include the on going projects

Technology Options

Technologies for onsite:

New technologies: Vacutug (desludging vehicle), Shallow Sewerage, Small-Bore Sewerage (STEDS), Anaerobic Baffled Reactor
Improved Leach Pit designs

Septic Tank

TECHNOLOGY Choice must be appropriate (eg. Unsuitability of waste incinerator; Right choice – C-DOT switching systems brought telecom revolution)

Decentralized:

Septic Tank/common septic tank + Septage transport + Treatment + Reuse/disposal

Waste water collection and transport + waste water treatment + reuse/discharge (3-5 mld or less)

Centralized

Full underground sewerage system + Waste water treatment facility + reuse/discharge

User Level Issues ...

- Behavioral Issues (demand driven; health consciousness)
- Affordability Issue (margin money; loan; subsidy)
- Space Constraint (especially in urban areas; community toilets)
- Community drive to stop open defecation more effective than restrictions imposed from the outside by the administration

Issues & Challenges...

- Inadequate Planning (City Sanitation Plans)
- Conventional Piped Sewer System cannot be the universal solution because of;
 - Land Availability
 - Prohibitive Cost (Avg. per capita cost for Cuttack Sewerage System: Rs. 13000/-)
 - Lack of long term concessional funding
- Poor Financial Health and Lack of Capacity with ULBs
- **Issues related to Sewer House Connections**
- Cost Recovery & Sustainability

Way Forward

- Universalisation Goal: National programme
- Selection of Appropriate Technology (Based on Life cycle cost & Land Availability)
- Reserving Land for Sanitation Infrastructure at Planning stage
- Ensuring Community Participation in planning , Decision Making and Implementation: Intensive IEC activities
- Inter-Departmental Coordination in Planning and Implementation (Sewerage, Drainage, Solid Waste. Water Supply, Land)
- Intensive Project Monitoring: Use of IT Solutions

Way Forward

- Improve Consumer Base (mandatory household connections)
- Efficient Service Delivery
- Financial Recovery (CAPEX/OPEX): Tariff Revision
- Institutional Strengthening and Capacity Building
- Creation of Socio Engineering Cell
- Encourage PPP
- Affordable Alternate Technology Options

Sustainability Matrix

Revenue Recovery Plan (Case Study-Cuttack)

Sl.	Scenario	Initial Deposit in Rs.	Monthly Sewerage Tariff in Rs.
Existing			
1	Recovery of OPEX (grossly inadequate)	1500	20
Proposed			
1	Scenario-1 :(CAPEX as Grant & recovery of Opex)	2500	100
2	Scenario-2: (Recovery of Capex & Opex)	3500	175

Considerations:

- 5 % hike in tariff every year
- O & M expenses are assumed to be increasing @ 6 % every year
- Sinking fund for M & E items are considered
- 30 years project Operation period
- Interest Calculation as per JICA loan conditions

JICA Assisted Odisha Integrated Sanitation Improvement Project

PROJECT COST: Rs. 2975 Crs

GOAL: Improve water quality of surrounding Rivers and upgrade sanitary condition in Cuttack and Bhubaneswar including Urban Poor.

SCOPE:

- ↓ SEWERAGE WORKS (BHUBANESWAR & CUTTACK)
- ↓ DRAINAGE WORKS (CUTTACK)
- ↓ INSTITUTIONAL CAPACITY BUILDING
- ↓ SOCIAL DEVELOPMENT & PUBLIC AWARENESS
- ↓ LOW COST SANITATION (43 LCS) & SLUM SANITATION IMPORVMEMENT (20 SLUMS)

PROGRESS UPDATE



PROGRESS UPDATE



PROGRESS UPDATE



PROGRESS UPDATE



PROGRESS UPDATE



ସୂଚନା

ଭୁବନେଶ୍ୱର ସହରର ପରିମଳ ବ୍ୟବସ୍ଥାର ଉନ୍ନତିକରଣ ନିମିତ୍ତ "ଭୁବନେଶ୍ୱର ସମନ୍ୱିତ ସ୍ୱେଚ୍ଛାତ୍ମକ ପ୍ରକଳ୍ପ" କାର୍ଯ୍ୟକାରୀ କରାଯାଉଅଛି । ଭୁବନେଶ୍ୱର ସମନ୍ୱିତ ସ୍ୱେଚ୍ଛାତ୍ମକ ପ୍ରକଳ୍ପ ଅଧିନରେ, ଆପଣଙ୍କ ଅଞ୍ଚଳରେ ନୂତନ କୁଚର ସ୍ୱେଚ୍ଛାତ୍ମକ ପାଇପ୍ ଲାଇନ୍ ଶିଳ୍ପ କାର୍ଯ୍ୟ କରାଯାଉଅଛି । କାର୍ଯ୍ୟ ସମୟରେ ଶାସ୍ତ୍ରା ମଧ୍ୟରେ ସମନାମନ - ଏବଂ ସାମ୍ବଲାନ ଚଳାଚଳ କରିବାରେ ଅସୁବିଧା ଉପୁଜିବାର ସମ୍ଭାବନା ରହିଅଛି । ଆପଣଙ୍କ ଅସୁବିଧା ପାଇଁ ଆମେ ଦୁଃଖିତ ।

ଉପରୋକ୍ତ କାର୍ଯ୍ୟ ସମାପନ କରିବାରେ ଆପଣଙ୍କ ସହଯୋଗ, ଆମର ଏକାନ୍ତ କାମ୍ୟ ।

ଓଡ଼ିଶା ଜଳସୋସାଇଟି ଓ ପରିମଳ ପରିଷଦ
ଭୁବନେଶ୍ୱର



PROGRESS UPDATE



Model of a sewerage system for Demonstration to Public

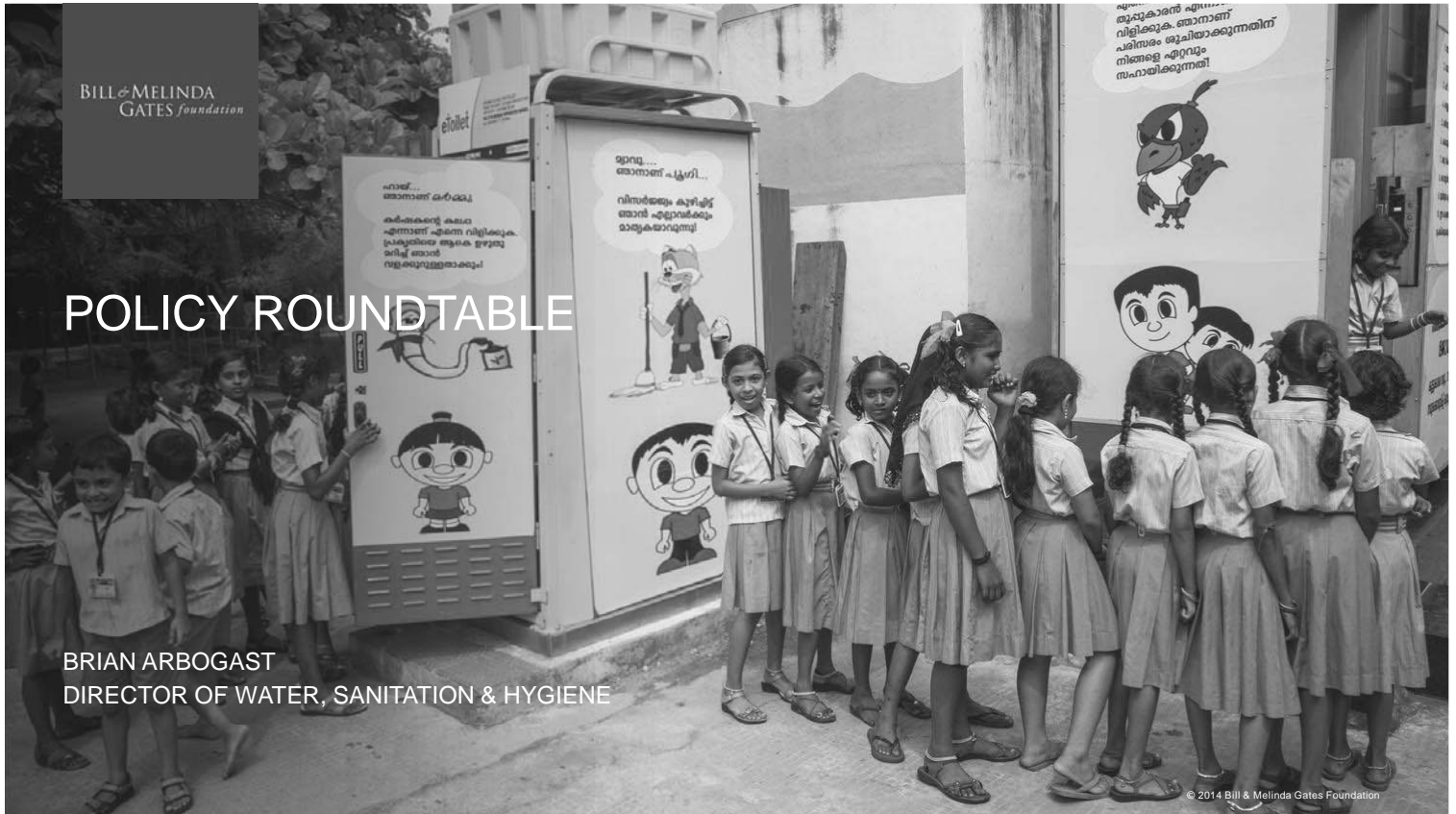


Catchy Slogans



POLICY ROUNDTABLE

BRIAN ARBOGAST
DIRECTOR OF WATER, SANITATION & HYGIENE



■ FAMILY VACATION – DAY 1



■ FAMILY VACATION – DAY 3



© Bill & Melinda Gates Foundation |

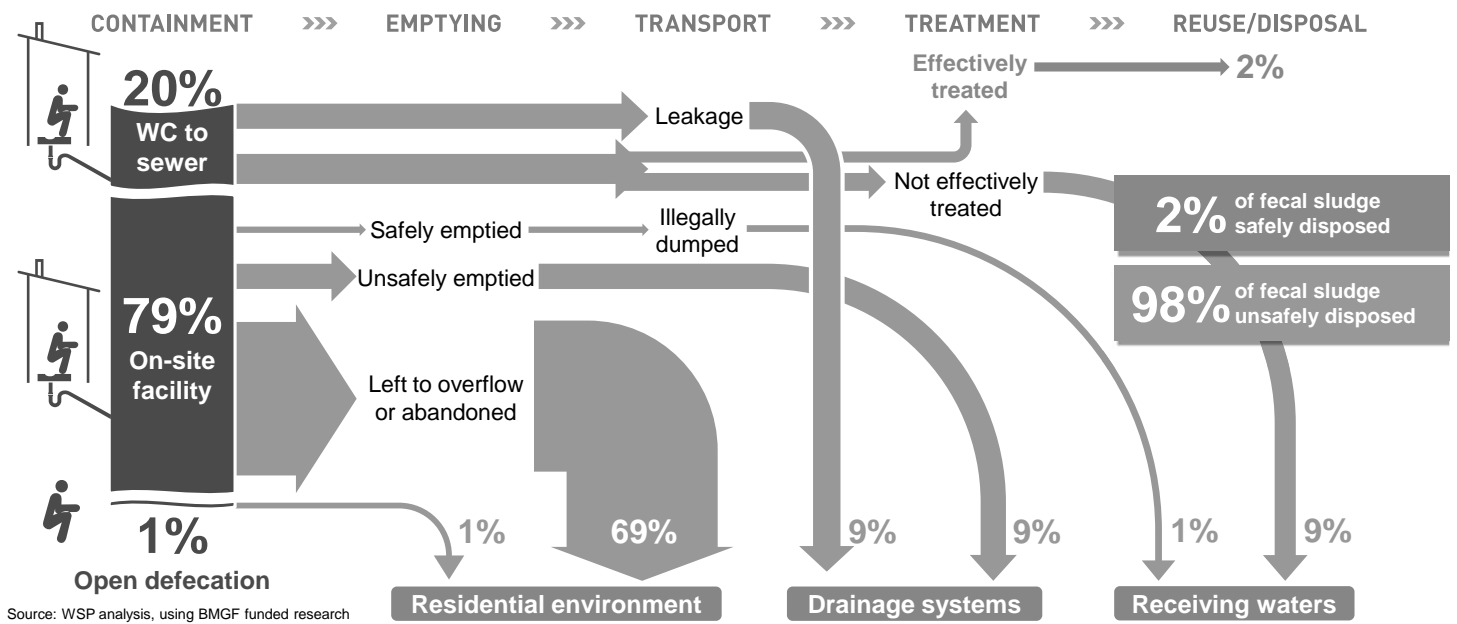
Understanding the Sanitation Service Chain

A toilet for containment of waste is necessary...



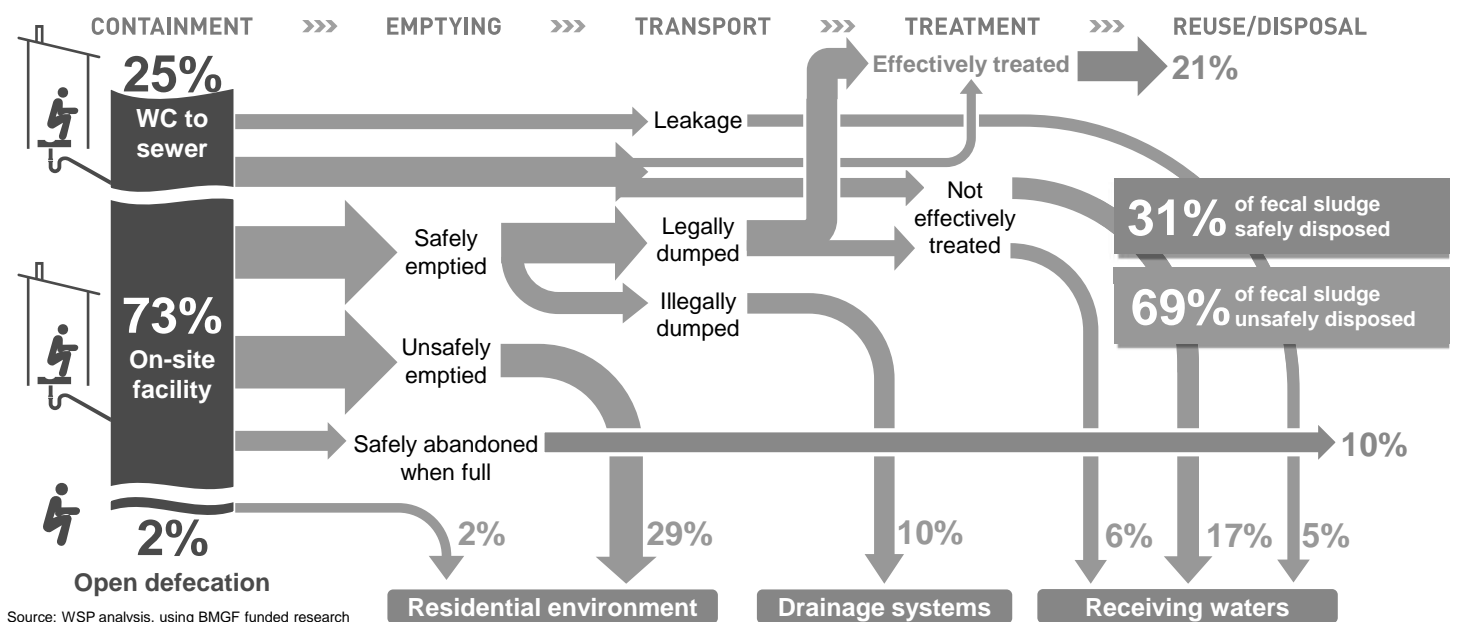
POOR FSM: INSTITUTIONAL OPEN DEFECATION

Sludge direct to the environment: no service chain

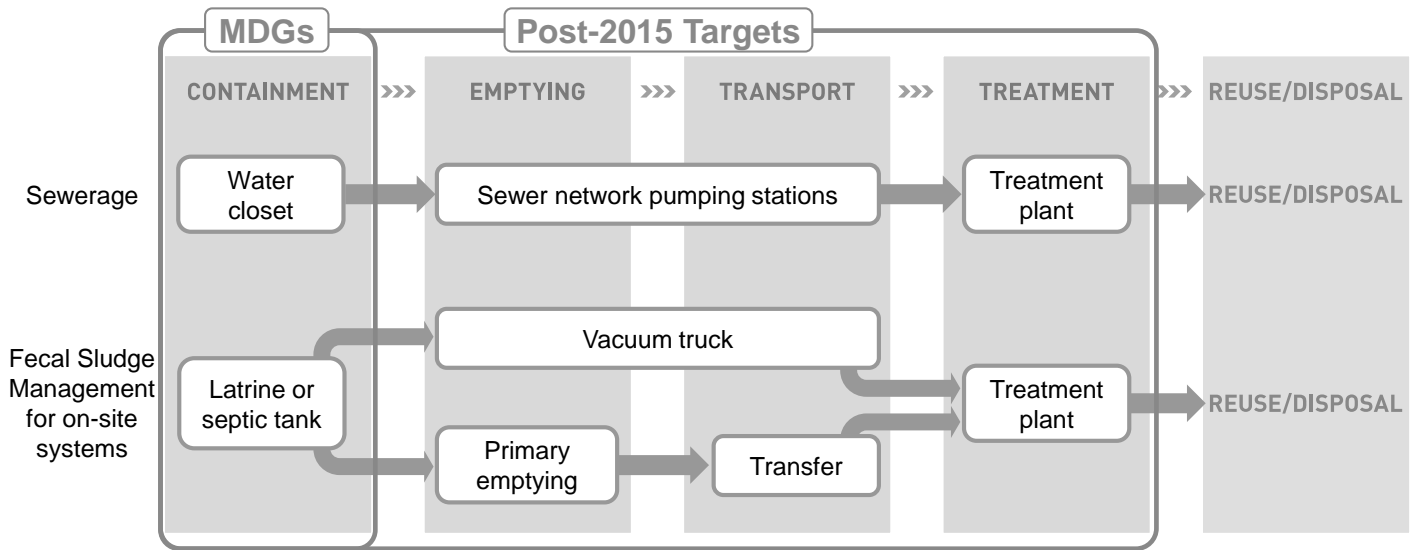


PARTIAL FSM: FRAMEWORK IN PLACE, SERVICES EXIST

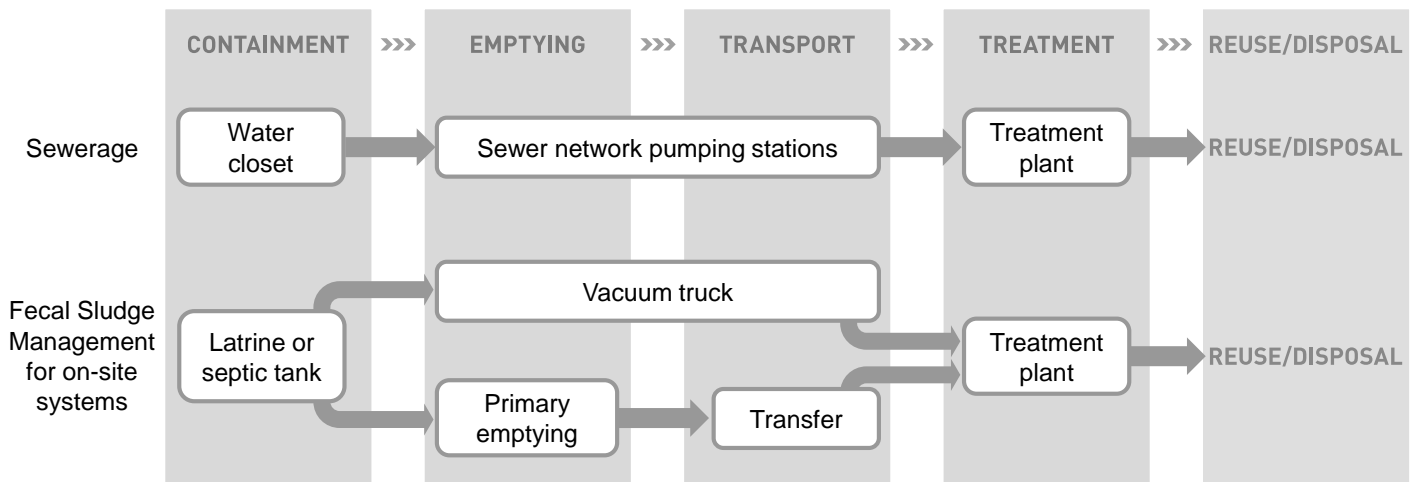
Some sludge safely transported and treated



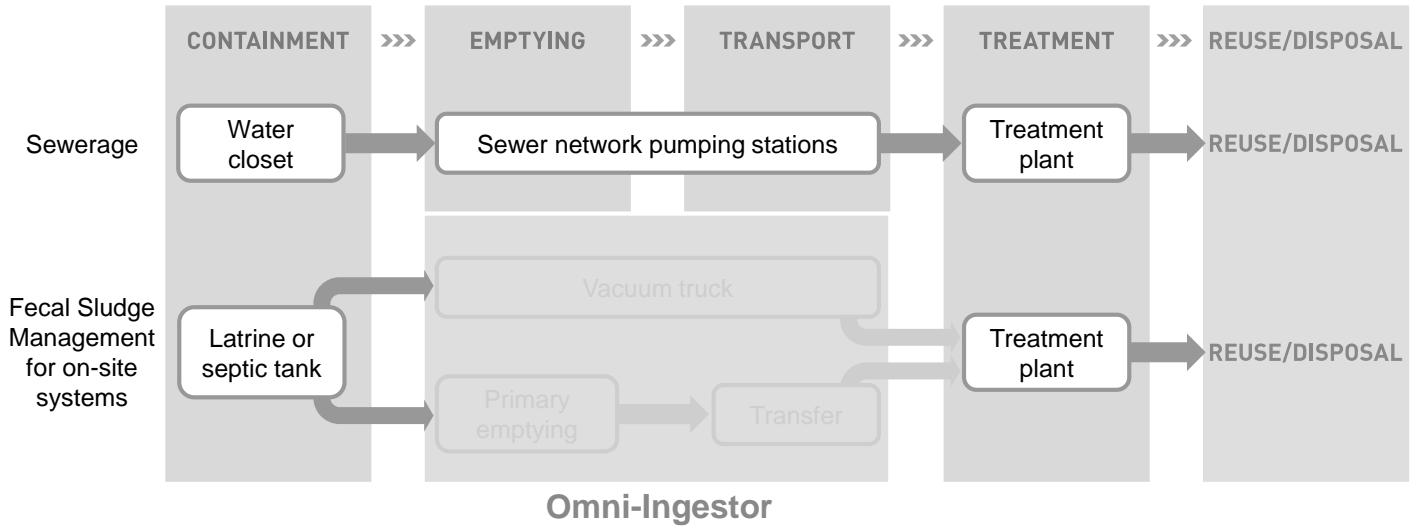
■ THE WAY THE WORLD IS MEASURING PROGRESS IN SANITATION IS INSUFFICIENT.



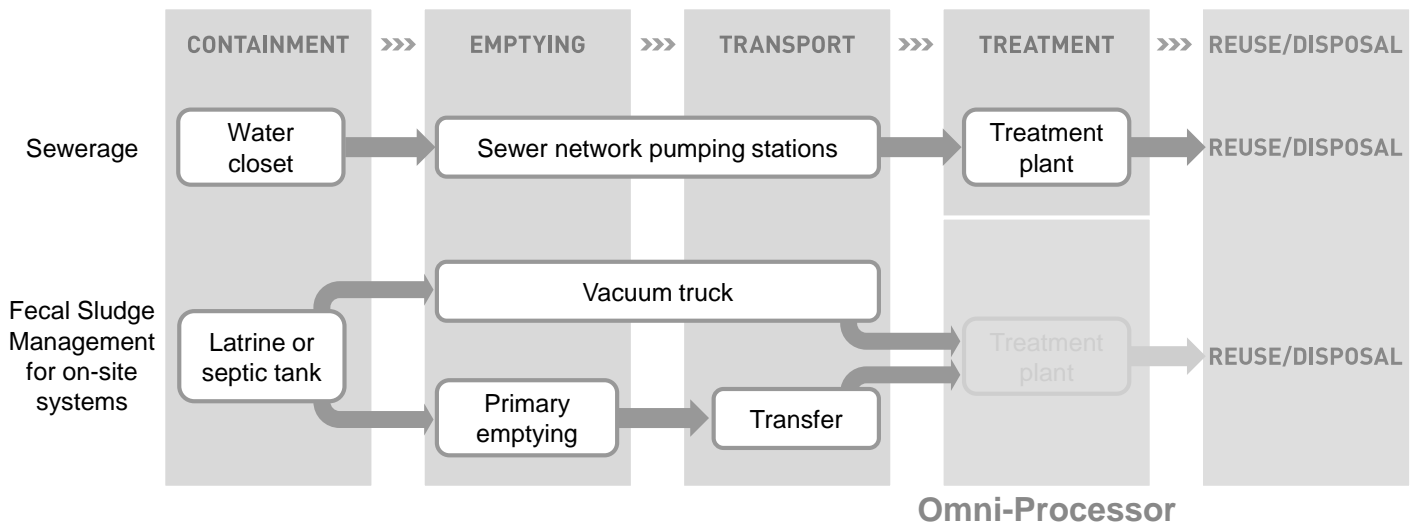
■ SANITATION SERVICE CHAIN: OUR INVESTMENTS



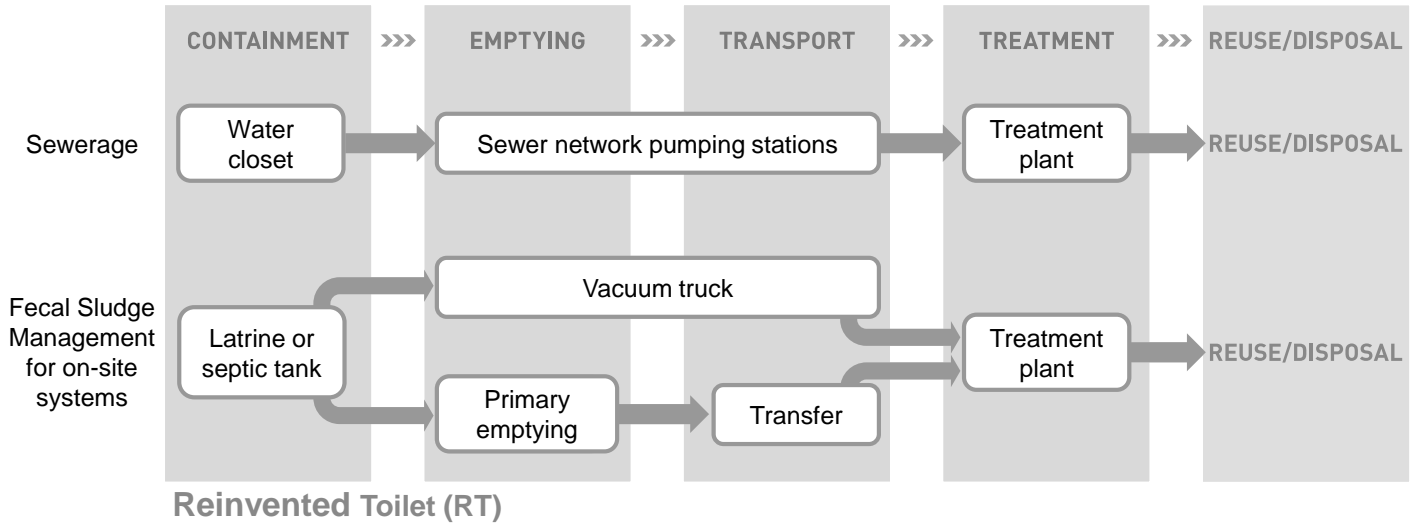
■ SANITATION SERVICE CHAIN: OUR INVESTMENTS



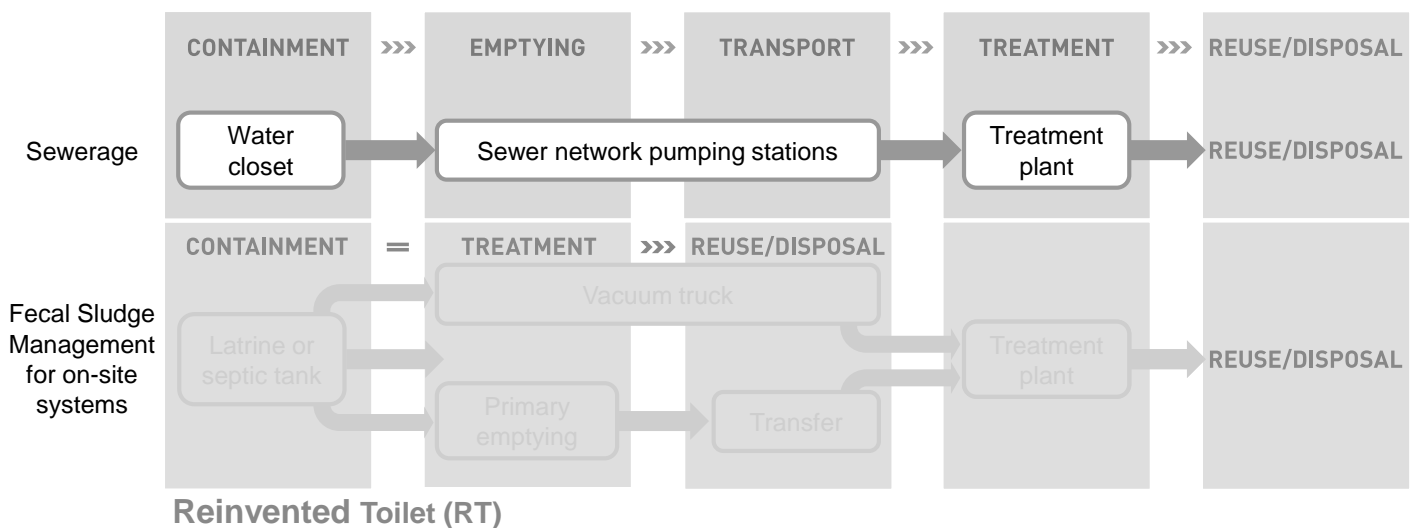
■ SANITATION SERVICE CHAIN: OUR INVESTMENTS



■ SANITATION SERVICE CHAIN: OUR INVESTMENTS



■ SANITATION SERVICE CHAIN: OUR INVESTMENTS



THANK YOU

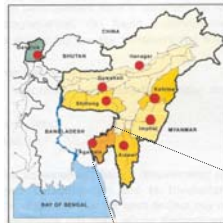


Septage Management in Tripura (Decentralized Option)



Dr. K. Rajeswara Rao, IAS
Principal Secretary to the Govt. of Tripura
March 22, 2014

Location of Tripura



International Boundary
839 Km (83.82%)

Demography of Tripura

- Total Population (2011) - 36,71,032
 - » Urban - 9,60,981 (26.17%)
 - » Rural - 27,10,051 (73.83%)
- Total Area - 10,486 sqkm
- Sex Ratio - 961
- Literacy - 95%

History of Urbanization in Tripura

Year	No. of Towns	Total Urban Population
1901	1	6,145
1911	1	6,831
1921	1	7,743
1931	1	9,580
1941	1	17,693
1951	1	42,595
1961	6	102,997
1971	6	162,360
1981	10	225,568
1991	12	421,721
2001	13	543,094
2011	16	960,981
2014	20	1,020,430

Status of Urban Local Bodies (2014)

Category	Number	Population	Area (sqkm)	Density (persons/sqkm)
Municipal Corporation	1	4,38,408	76	5,731
Municipal Council	10	2,32,872	98	2,372
Nagar Panchayat	9	1,01,999	67	1,516
Total	20	7,73,279	241	3,196

Sanitation in Urban Tripura

- Population in Urban Tripura
 - 21% of the population
 - AMC predominant share (61%)
 - Rest of state urban population distributed in Small (12%), Medium (16%), Large Towns (11%)
 - 98% of households in urban Tripura have toilets (including katcha, pit etc)
 - Substantial number of insanitary toilets

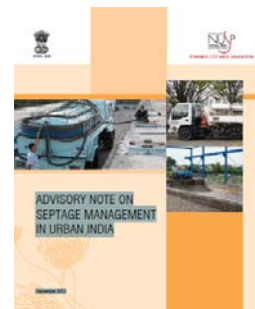


Why Septage Management?

- MoUD advisory on septage management
- Pollution and public health risk
- Mission of Urban Sanitation Strategy
- Small towns and investments in sewer technology a scale issue
- Cost effective
- **10% lumpsum scheme provides for septage management and pilot demonstration**

Details	Network*	On-site
Capex (Rs/HH)	25000	5000
Opex (Rs/HH)	2000	1600

Average of HPEC Estimates and actual cost incurred for several Sewer systems implemented in Tamil Nadu under World Bank Project



Basis for the Strategy

1. **Need for Septage Management**
 - a. 93% of urban latrines are on-site sanitation systems
 - b. No safe septage emptying and disposal arrangement
 - c. Pollution risks and public health concern, esp. lowlands
 - d. Mission of Urban Sanitation Strategy
 - e. Small towns and investments in sewer technology a scale issue



Key Elements of Strategy - Vision

- a. Time frame: 2017
- b. Create “an effective septage management system, managed by urban local bodies, supported by septage carriers/haulers and wastewater and septage treatment facility operators with adequate regulatory and oversight systems”
- c. Eliminate the practice of discharging night soil into storm water drains, land or water bodies
- d. Protection of human and environmental health

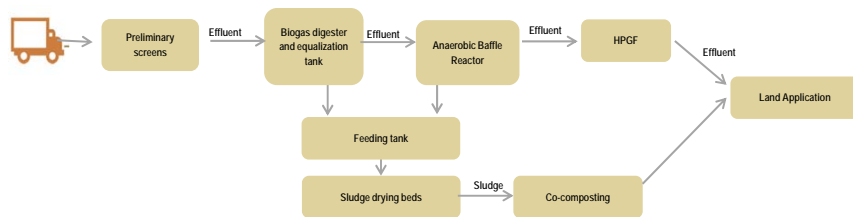
Key Elements of Strategy...Principles

- a. **Improved information systems for planning, learning and management**
- b. **Septage management as a necessary service for households and establishments**
- c. **Institutional roles and responsibilities in line with the trajectory for deepening devolution**
- d. **Increased awareness of ULB managers and Citizen - changing mindsets**
- e. **Sustainability of arrangements**
- f. **Septage as a resource**

Septage Management Strategy for Urban Tripura - Highlights

- **Vision in line with NUSP and State Urban Sanitation Strategy**
- **Target for clean, sanitised urban Tripura by 2017**
 - **Two years for capital investments, 2+1 year for stabilising O&M**
- **Principles and Goals of the strategy**
- **Institutional Structure at State and in ULBs**
- **Planning, Capacity Building, Implementation and Handholding**
 - **Details of these activities**
 - **Phasing of these activities**
 - **System for cross-learning across ULBs**
- **Monitoring, Information Systems and Monitoring Verification Protocols**

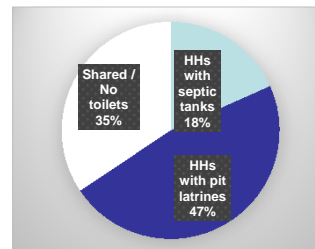
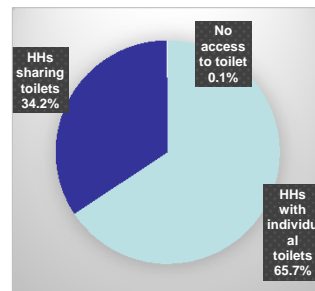
Total Sanitation Program for Bishalgarh, Tripura



Bishalgarh Municipality Sanitation Overview



- ~5900 households with a population of ~21000
- Sanitation provision relies entirely on on-site systems connected to a mix of septic tanks and traditional single and twin pits
- Over 99% of households have access to a toilet
- Only 8 households in Bishalgarh have no access to a latrine



Intensive consultations with key stakeholders

- With Elected Representatives of Bishalgarh Municipality for about 15 times over a period of last 2 years about decentralized options.
- With Community Volunteers about their preferences.
- Several field visits and interactions with individual families.
- Interaction with State level representatives on policy and strategy issues.
- Exposure visit of stakeholders to Malaysia on Septage Management.

Sanitation management in Bishalgarh

While a majority of the households have access to toilet facilities, there are inadequacies in the management of the liquid effluent and septage generated from the septic tanks and pits.

Challenges with Septic tanks

- Less than 50% septic tanks are connected to a soak-pit, of which 87% are located in low-land area and are not effective due to a high water table
- Remaining tanks either do not have an overflow (31%) or drain into the open (21%)
- Results in contamination in the area surrounding the septic tank
- Most households surveyed do not report any desludging undertaken for the septic tanks within their premises

Challenges with Pit latrines

- 47% of total households have toilets connected to a pit (single pit offset, 2 pit offset or 1 pit direct below)
- 86% pits are unlined pits



Status of solid waste management in Bishalgarh

- Currently no system for collection of the municipal waste
- As part of the survey conducted for this study, 72% HHs reported that they resort to open dumping while remaining 28% that the households dump their municipal waste at specified locations within the area.
- The project activity proposed aims to safely collect and manage the solid waste from the Town.
- An estimated 10.72 MT solid waste is generated in the Town, of which 7.50 MT is the organic fraction to be processed.

Components of proposed scheme

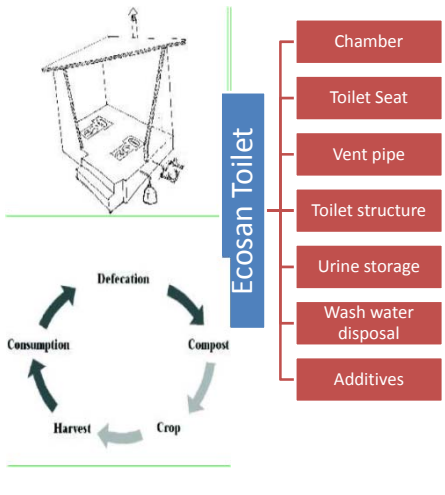
Construction of new toilets to replace inadequate toilets / to create access to toilets

Management of liquid effluent generated in existing septic tanks

Septage management including collection, transportation, treatment and disposal

Management of municipal solid waste generated in Bishalgarh

Construction of new toilets – Ecosan Toilets




The diagram illustrates the components of an Ecosan Toilet and the cycle of waste management. The components are listed as follows:

- Chamber
- Toilet Seat
- Vent pipe
- Toilet structure
- Urine storage
- Wash water disposal
- Additives

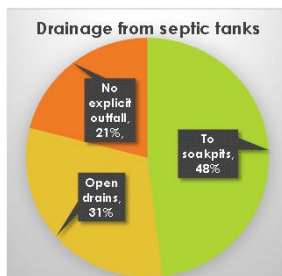
The circular flow diagram shows the process: Consumption leads to Defecation, which results in Compost. This Compost is used for Crop, which is then Harvested and consumed, completing the cycle.

- Ecosan toilets require due attention to proper operation and maintenance.
- These toilets also require that the users be educated in the proper use of these toilets, specifically the concept and advantage of segregation of faeces, urine and Washwater.
- Key operation and maintenance issues that need attention are:
 - Adding Additives
 - Washwater
 - Hygiene
 - Other precautions
 - Maintenance requirements



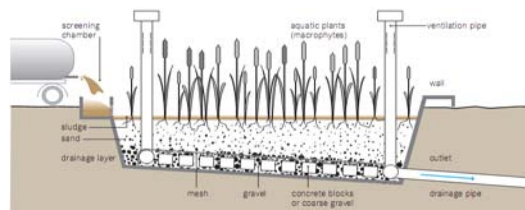
Treatment of liquid effluent from septic tanks

Liquid effluent management options



Land topography	No. of inadequate septic tanks	Nature of proposed assistance	Cost of intervention (Lakhs)
High-land (low groundwater table)	109	New soakpits needed where drainage for liquid effluent does not exist for septic tanks	22 Lakhs
Low-land (high water table)	903 (~169,100 l/day of effluent)	Liquid effluent collection and treatment system to be created for all septic tanks.	295 Lakhs

- A decentralized in-situ treatment scheme using horizontal planted gravel filter (HPGF) is proposed.
- Each ward will be segmented into 4 treatment zones and each septic tank will be connected through a pipe to the HPGF in that zone.



Septage collection and transportation

Mini vacuum tanks (vacutugs) or cart mounted vacuum tanks to access individual households



Larger conventional vacuum truck to transport septage to the septage treatment facility



O&M Considerations:

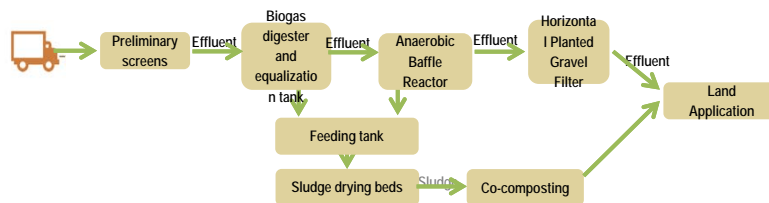
- small amount of sludge should be left in the tank
- advisable to avoid using fire
- scrub the septic clean or use chemicals such as detergents etc

Cost of trucks:
59 Lakhs

S.No	Aspect	Description
1	Septic tanks to be emptied daily	2
2	Number of vacutugs or cart mounted vacuum tanks required	4
3	Number of vacuum trucks required	3

Septage treatment

Need to create processes and systems to collect, transport, treat and safely dispose the septage generated in the existing septic tanks in the city



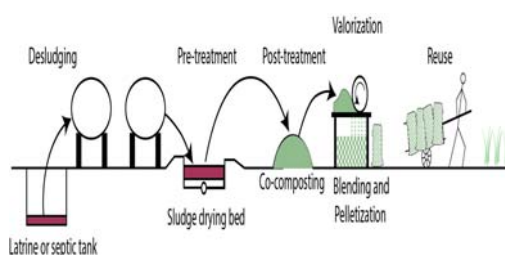
Key considerations:

- The dried sludge post the sludge drying beds is proposed to be co-composted with the organic fraction of the municipal solid waste generated in the town
- The scheme incorporates an anaerobic decomposition stage in a biogas digester before the sludge drying beds to improve dewatering characteristics of the sludge
- Cost of the facility will be **89 Lakhs**.

Co-composting with municipal solid waste

Additional components required for co-composting with solid waste

Composting unit with cover
Pelletization and enrichment unit (optional)
Storage facilities
Organic solid waste sorting bay



- 7.5 tpd organic waste
- 0.9 tons dried sludge
- Co-composting period ~3 months.
- Area requirement of 2,096 m²
- Cost: ~440 Lakhs

Cost of scheme – Capital Cost

S.No.	Details	Cost (Rs. Lacs)	Inclusions
1	Cost of construction of new / improvement to toilets	599.75	New ecosan toilets
2	Cost of septage management	148.19	Trucks for septage collection; Septage treatment facility
3	Cost of construction of soak away	21.80	New soak-aways for septic tanks in low ground water area
4	Cost of pipes	295.16	Pipes for liquid effluent collection in low land areas
5	Cost of Solid Waste Management	442.54	Cost of household bins, tricycles, trucks and solid waste composting facility
	Total Cost	1507.44	




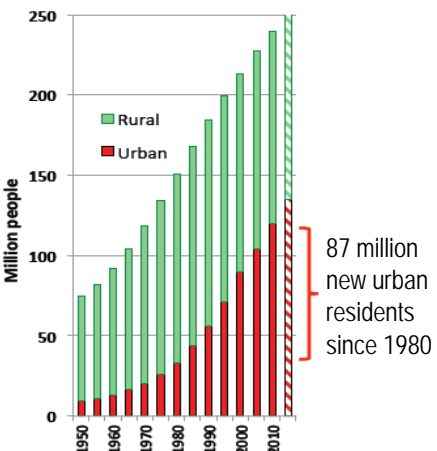


Beyond Sewerage Systems: Scaling Up Urban Sanitation in Indonesia

Almud Weitz
Water and Sanitation Program, World Bank



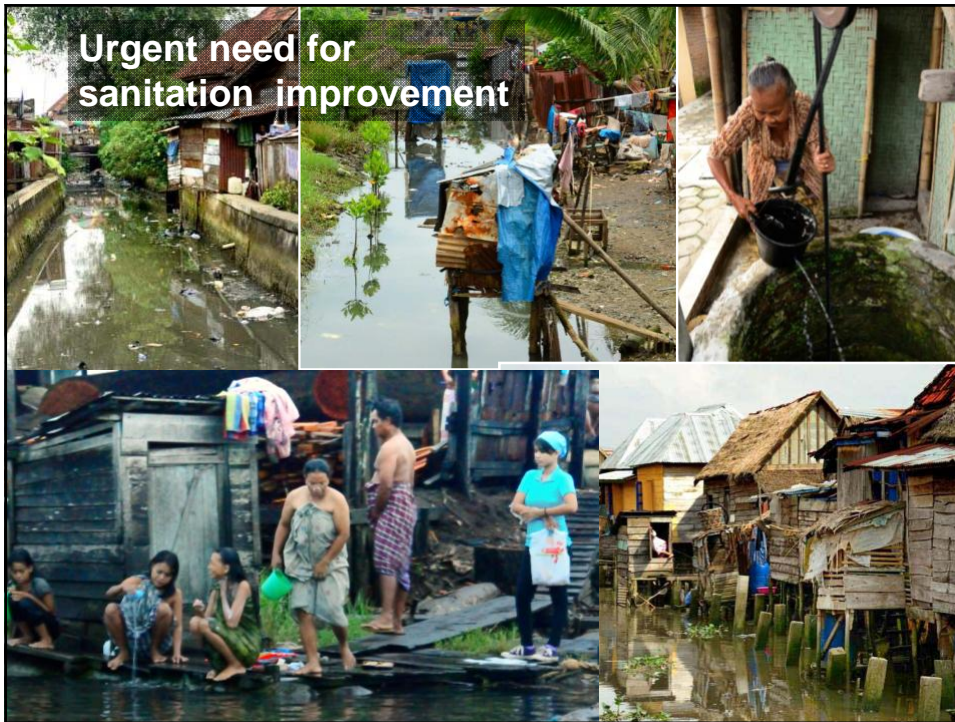
Large, dense, rapidly growing towns and cities in Indonesia

Year	Rural	Urban
1950	75	10
1960	95	15
1970	120	25
1980	150	40
1990	185	65
2000	215	95
2010	240	130

Source: UNDESA 2012

- < 2% centralized sewers and treatment
- Mostly pour flush to soakpits “*tanki septik*” with overflows
- 18% urban open defecation
- Severe water contamination and under 40% piped water
- Weak water utilities
- Local governments responsible for sanitation but still maturing

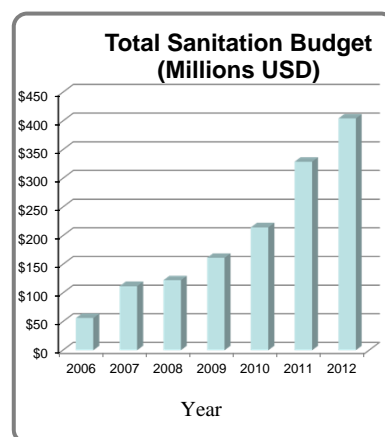


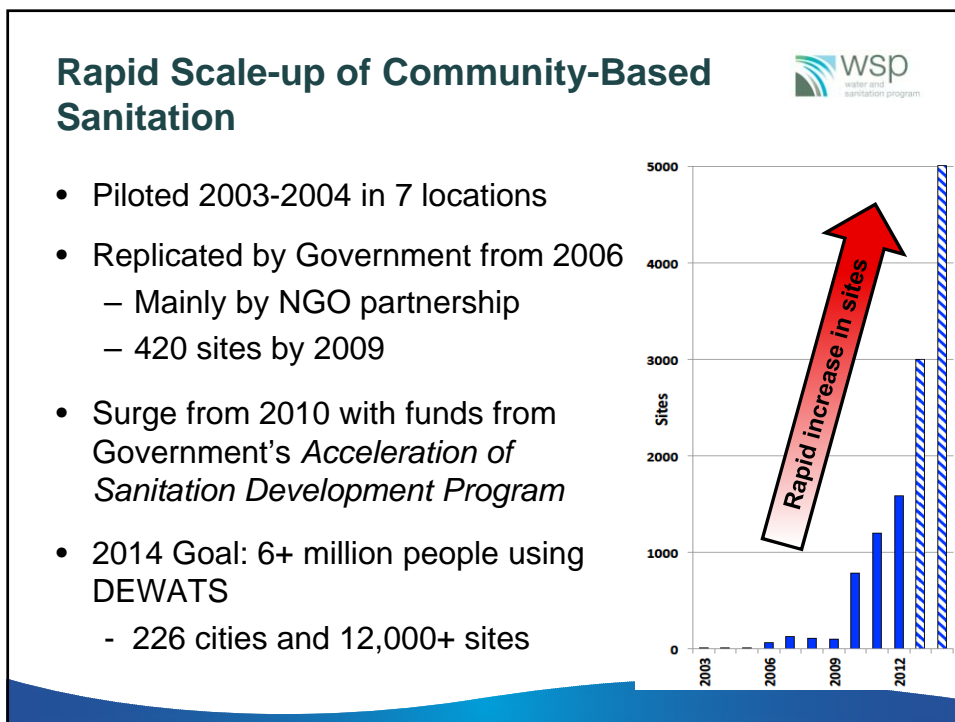
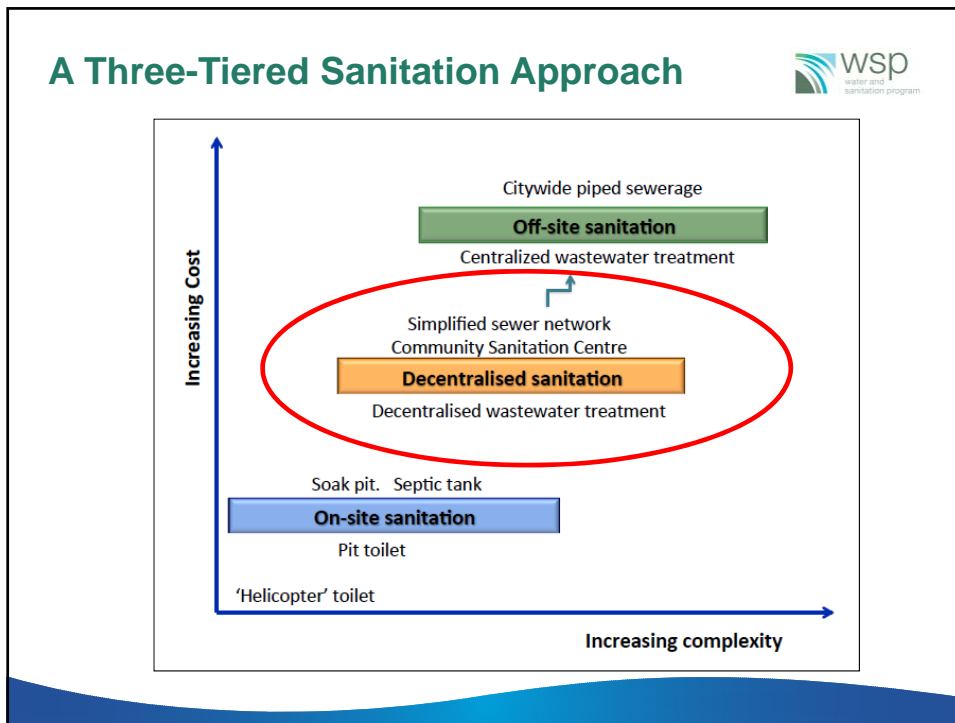
Urgent need for sanitation improvement

Government Enabling Policy



- National Medium Term Development Plan 2010-2015 focuses on
 - eliminating open defecation
 - 10% urban residents with decentralized and centralized sewerage systems
- Acceleration of Sanitation in Human Settlements Program (446 cities)
 - to build local capacity and prepare city sanitation strategy & plan





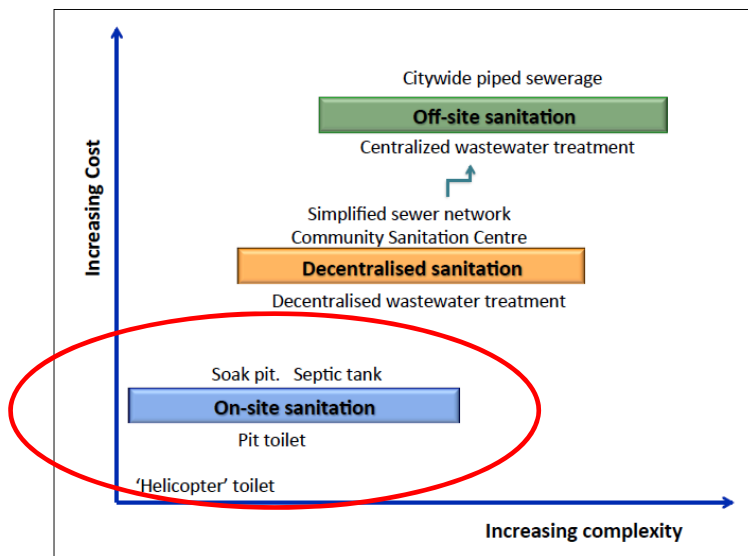
Community DEWATS Can Work Well

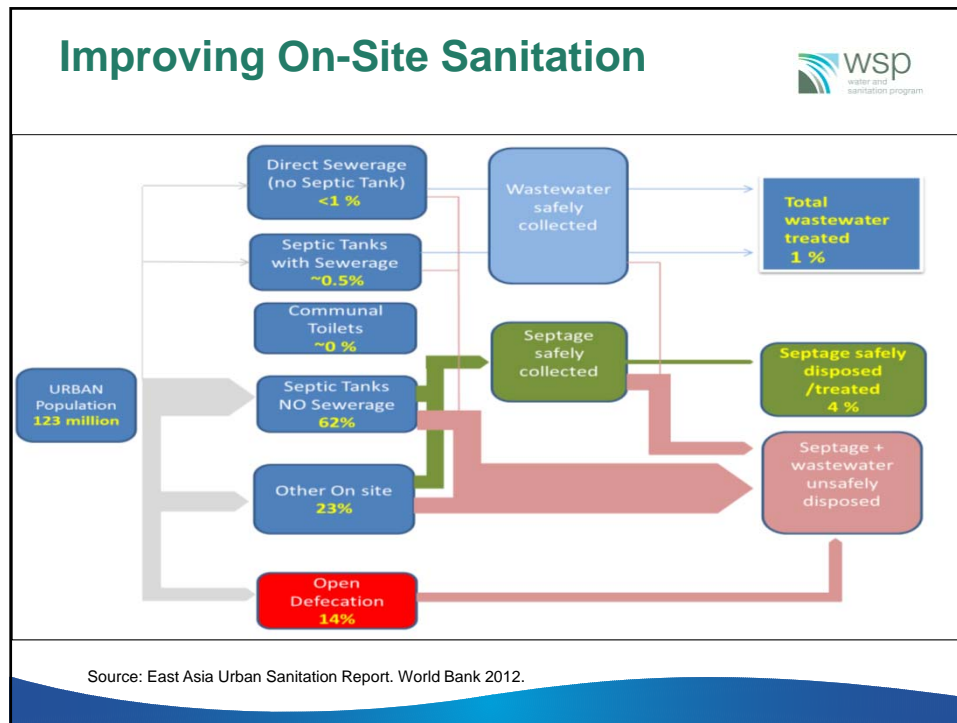


- 90+% DEWATS well liked, popular, kept clean
- Systems are not cheap but cost effective if used at full capacity
- Good targeting of poor communities, and poorest households in those
- Community management OK for daily operation, but needs local government support beyond that
- Systems to be part of city-wide strategy



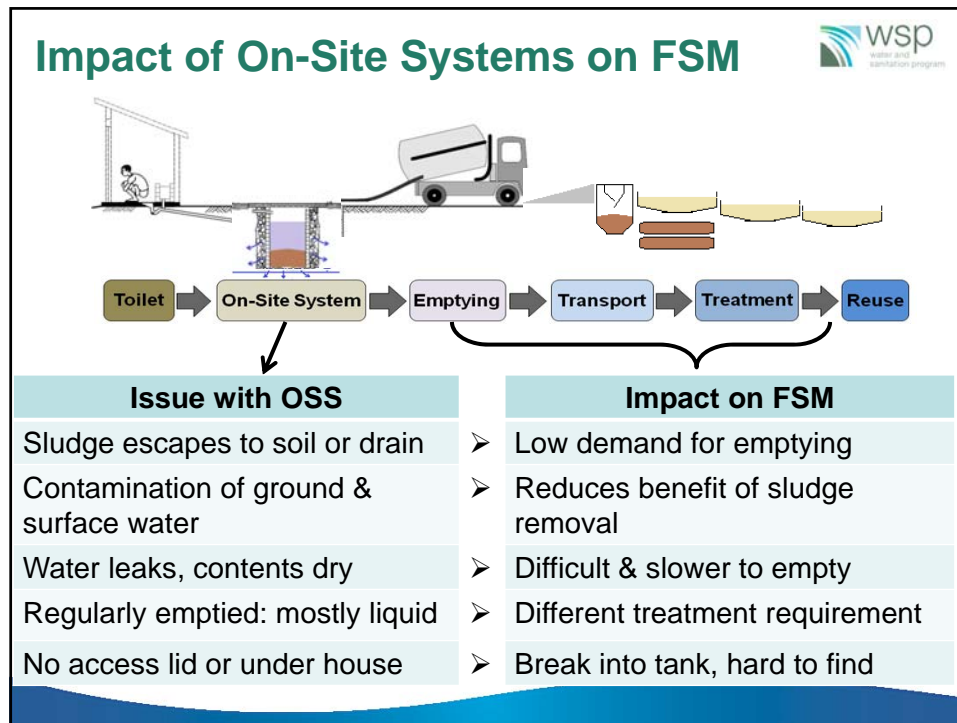
A Three-Tiered Sanitation Approach





What is Really Down There?

- 83% unsealed pits, 19% have dry contents
- 1st empty at 16 years, half full of sludge
- 2nd/regular emptying 2-4 years, mostly liquid
- 22% systems overflow to drain, less sludge accumulation
- 97% greywater directly to drain
- Hard to access, 20% under house



FSM Business Model Study 2013

- Limited demand for tank emptying services – *in Palu demand mostly in inner-city neighborhoods*
- Sludge tankers in three of four cities are old and in poor condition
- Private sector activity in Jombang and Tegal, but spare capacity because of low demand
- All septage treatment plants grossly under-loaded/over-designed for the actual demand

17/04/2014
12



Metro sludge tanker – 18 years old, small capacity (2m³) and frequent breakdowns

13



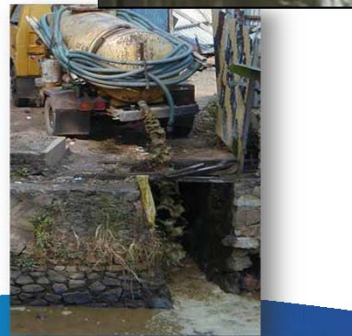
Low demand for emptying but very large UPTDs

14

Challenges



- Poor understanding of improved on-site systems that leads to low demand for emptying (83% *cubluku*s, unsealed base)
- Fecal sludge management is “invisible” to policy makers - sewerage is seen as the “proper” solution
- Technical and institutional issues requiring resolution



A Promising Start...



- Improve awareness from policy makers to institutionalize implementation of sanitation service chain
- Improve current system and start to introduce regular desludging in potential areas
- Enable local private operator involvement, in particular for desludging activities
- Identify re-use as a potential initiative





Annexure 4: List of Participants

Government of India	
Ms Anita Agnihotri	<i>Secretary, Ministry of Housing and Urban Poverty Alleviation, Government of India</i>
Dr K VijayRaghavan	<i>Secretary, Department of Biotechnology, Ministry of Science and Technology</i>
Ms Nandita Mishra	<i>Director, PHE, Ministry of Urban Development, Government of India</i>
Mr Premjit Lal	<i>Director, Housing, Ministry of Housing and Urban Poverty Alleviation</i>
Mr Krishnagopal Chellappan	<i>NUSP Cell, Ministry of Urban Development</i>
State and City Governments	
Mr Injeti Srinivas	<i>Development Commissioner cum Addl. Chief Secy. Housing and Urban Development Department, Government of Odisha</i>
Mr K Phanindra Reddy	<i>Secretary, Municipal Administration and Water Supply Department, Government of Tamil Nadu</i>
Mr K Rajeswara Rao	<i>Principal Secretary, School Education, Urban Development and Tourism Departments Government of Tripura</i>
Mr Rajiv Jalota	<i>Additional Municipal Commissioner, Projects, Municipal Corporation of Greater Mumbai</i>
Mr Ramyakumar Bhatt	<i>Assistant Commissioner, Ahmedabad Municipal Corporation</i>
Mr S Laxmipati	<i>Member Secretary, Odisha Water Supply and Sewerage Board</i>
Mr KC Sahoo	<i>Additional Secretary, Housing and Urban Development Government of Odisha</i>
Mr Bariwal	<i>LSGD, Rajsthan</i>

Mr OP Kala	<i>LSGD, Rajsthan</i>
Mr DR Jangid	<i>LSGD, Rajsthan</i>
Other Invited Participants	
Prof. Srinivas Chary	<i>Dean, Administrative Staff College of India</i>
Mr Somnath Sen	<i>Adviser, Indian Institute of Human Settlements</i>
Dr Renu Khosla	<i>Executive Director, Centre for Urban and Regional Excellence</i>
Ms Smita Rao	<i>Vice President, iDeck</i>
Ms Jayamala Subramaniam	<i>CEO, Arghyam</i>
Ms Neelima Thota	<i>Director, Urban Programme, Arghyam</i>
Mr Barjor Mehta	<i>Lead Urban Specialist, World Bank, New Delhi</i>
Mr Ashok Srivastav	<i>Urban Specialist, Asian Development Bank, New Delhi</i>
Mr Ron Slangen	<i>Urban Specialist, Asian Development Bank, New Delhi</i>
Ms Regina Dube	<i>Senior Adviser, Head Sustainable Urban Habitat, GIZ India</i>
Prof. Jagan Shah	<i>Director, National Institute for Urban Affairs</i>
Prof. Dinesh Mehta	<i>Professor Emeritus, CEPT University</i>
Prof. Meera Mehta	<i>Professor Emeritus, CEPT University</i>
Dr Joseph Ravikumar	<i>Senior Specialist, WSP-SA</i>
Mr Bibhas Mohapatra	<i>Director, OP&HS Infra, Bhubaneswar</i>
Ms Almud Weitz	<i>Principal Team Leader, WSP East Asia, Pacific and South Asia- World Bank</i>
Ms Babitha George	<i>Director, Quicksand, Bangalore</i>
Ms Pratima Joshi	<i>Executive Director, Shelter Associates, Pune</i>
Dr Rajib Dasgupta	<i>Associate Professor, Centre for Social and Community Medicine, Jawaharlal Nehru University</i>

Mr Brian Arbogast	<i>Bill and Melinda Gates Foundation</i>
Mr Hari Menon	<i>Bill and Melinda Gates Foundation</i>
Dr Doulaye Kone	<i>Bill and Melinda Gates Foundation</i>
Ms Alyse Schrecongost	<i>Bill and Melinda Gates Foundation</i>
Dr Roshan Shrestha	<i>Bill and Melinda Gates Foundation</i>
Dr Girindre Beeharry	<i>Bill and Melinda Gates Foundation</i>
Ms Dipika Ailani	<i>Bill and Melinda Gates Foundation</i>
Ms Diane Scott	<i>Bill and Melinda Gates Foundation</i>
Ms Madhu Krishna	<i>Bill and Melinda Gates Foundation</i>
Jan Willem Rosenboom	<i>Bill and Melinda Gates Foundation</i>
Linda Patterson	<i>Bill and Melinda Gates Foundation</i>
Mr Shubhagato Dasgupta	<i>Centre for Policy Research, New Delhi</i>
Dr Anjali Chikersal	<i>Centre for Policy Research, New Delhi</i>
Mr Amandeep Singh	<i>Centre for Policy Research, New Delhi</i>
Mr Aditya Bhol	<i>Centre for Policy Research, New Delhi</i>
Mr Nikhil George	<i>Centre for Policy Research, New Delhi</i>
Mr Prakhar Jain	<i>Centre for Policy Research, New Delhi</i>